

Understanding File and Print Sharing

LESSON

6

EXAM OBJECTIVE MATRIX

SKILLS/CONCEPTS	EXAM OBJECTIVE DESCRIPTION	EXAM OBJECTIVE NUMBER
Understanding File and Printer Sharing Basics		
Understanding HomeGroup	Understand file and print sharing.	4.2
Creating Public, Basic, and Advanced Shares	Understand file and print sharing.	4.2
Mapping Drives	Understand file and print sharing.	4.2
Understanding Permissions	Understand file and print sharing.	4.2
Setting Up Printer Sharing	Understand file and print sharing.	4.2
Troubleshooting Printers		

KEY TERMS

advanced sharing

basic sharing

effective permissions

HomeGroup

inherit

mapping a drive

network discovery

network location

NTFS permissions

permissions

printer driver

printer sharing

Public folder

share permissions

troubleshooter

workgroup

As the IT technician at Interstate Snacks, Inc., you've been asked to set up file and printer sharing for all of the computers at a remote warehouse. The employees there do not need constant access to the network at the main Interstate facility. All of the computers at the remote location are running Windows 7 Professional. There are two printers in the warehouse; one is attached to the supervisor's computer, the other is attached to a computer in the middle of the warehouse that all employees use to print pallet labels for outgoing shipments. Some folders on the supervisor's computer contain confidential files that need to be protected from access by other employees.

■ Understanding File and Printer Sharing Basics



THE BOTTOM LINE

Windows 7 provides many ways to share files or printers on a network. The first step is to ensure that file and print sharing is turned on in the advanced sharing settings in Network and Sharing Center. Some networking methods, such as HomeGroup, also require that your network location be set to Home network.

TAKE NOTE *

This lesson assumes you are working on a peer-to-peer network in a small office/home office setting. The network does not have a server and does not use a domain.

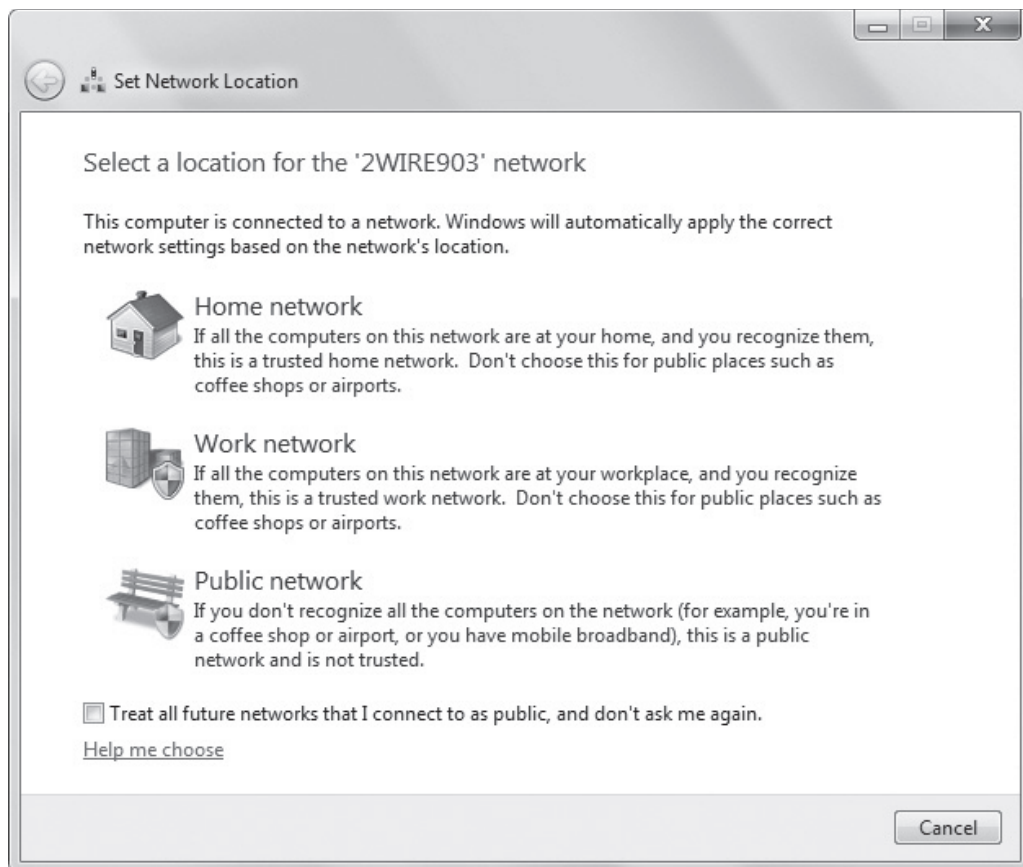
Microsoft offers several ways for Windows 7 users to share resources such as files and printers, either on the same computer (between accounts) or on a network, without the need for a server. For example, you can share files from any folder on your computer by setting up basic or advanced sharing, or by moving files to the Public folder. Another method is by using HomeGroup, the networking feature that's built into Windows 7.

To share files and printers with users on other computers, you need to have a wired or wireless network set up. In a typical wired environment, each computer has a network adapter that is connected to other computers and a hub, switch, or router with Ethernet cables. Wireless networks are easier to set up and maintain. Each computer's wireless network adapter connects "over the air" to a router or wireless access point within range.

Windows 7 offers three broad categories of network locations: Home, Work, and Public (see Figure 6-1). A **network location** is a collection of security settings that's appropriate for the type of network you want to connect to.

Figure 6-1

Network locations in Windows 7



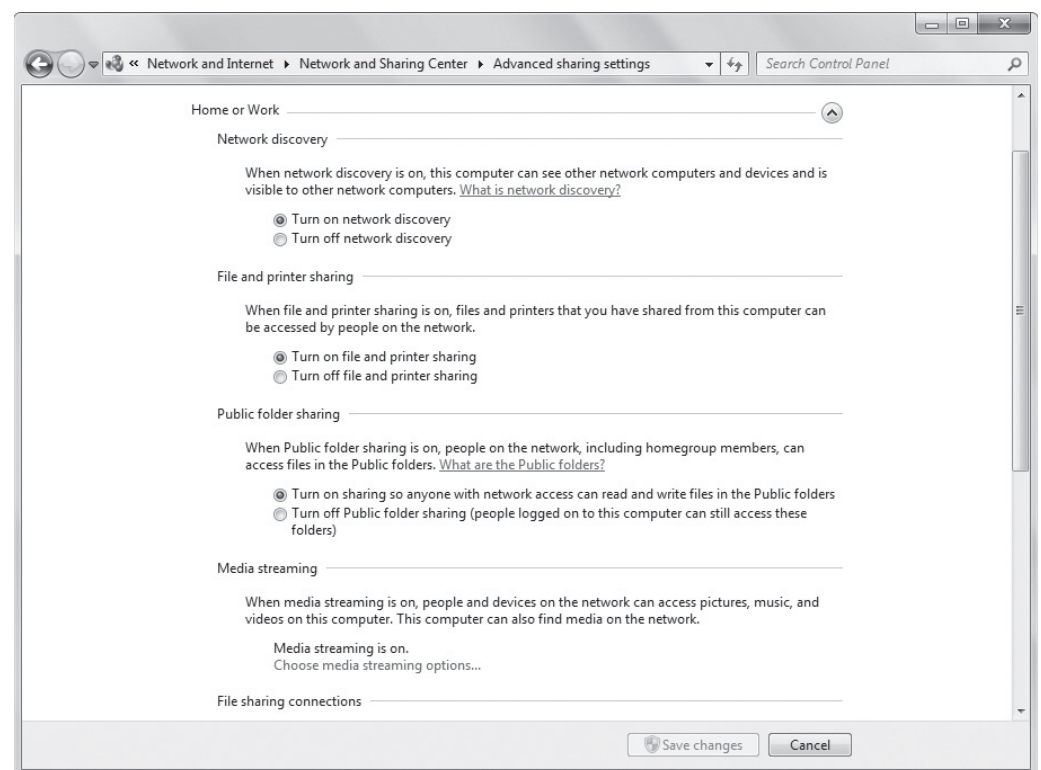
For example, the Home network location is the most trusting and is conducive to file and printer sharing—network discovery is turned on by default. The Work network location also has network discovery turned on but provides stricter security than Home. For example, you can't join a homegroup using the Work network location. The Public network location is used when you connect to public networks, like those offered at airports and libraries. Network discovery is turned off by default so other users can't see your computer. Public networks may be convenient but they are notoriously unsafe, so the Public network location is designed to help protect your computer against unauthorized access and malicious software.

TAKE NOTE *

Network discovery is a Windows feature that enables your computer to find other computers and devices (such as printers on a connected network). It also lets you control whether other computers can see your computer on the same network.

Whether wired or wireless, you must turn on file and printer sharing on each computer that will share files and/or printers. To do so, click the network icon in the notification area of the task bar and then click Open Network and Sharing Center. In the task pane on the left, click the *Change advanced sharing settings* link. Click the down arrow to the right of Home or Work. The advanced sharing settings are shown in Figure 6-2.

Figure 6-2
Advanced sharing settings in
Windows 7



Notice that network discovery, file and printer sharing, and Public folder sharing are all turned on. These settings allow you the maximum flexibility for sharing files in a small office/home office environment.

Finally, if your network includes a mix of computers running Windows 7 and Windows Vista or Windows XP, and you want to share files between the computers, you should use a workgroup. A **workgroup** is a logical grouping of networked computers that can “see” each other on a network. You’re prompted to set up a workgroup when installing Windows, and many

computers are set up to be a part of a workgroup named WORKGROUP by default. To see if your computer is part of a workgroup, click Start, right-click Computer, and then click Properties. Scroll down to the Computer name, domain, and workgroup settings section. The workgroup name is displayed there.

The following sections walk you through your file and printer sharing options in Windows 7.

+ MORE INFORMATION

To learn how to set up a small office/home office network, visit <http://windows.microsoft.com/en-US/windows7/What-you-need-to-set-up-a-home-network>. For more information on workgroups, see <http://windows.microsoft.com/en-US/windows7/Networking-home-computers-running-different-versions-of-Windows>

■ Understanding HomeGroup

↓ THE BOTTOM LINE

HomeGroup is a new feature in Windows 7 that greatly simplifies file and printer sharing on small office/home office networks. Using HomeGroup, you can share libraries and printers, but you don't have a lot of control over which users may share the items.

CERTIFICATION READY

What is a HomeGroup?

4.2

TAKE NOTE *

“HomeGroup” is the name of the Windows 7 feature. You set up a “homegroup” that other computers connect to for sharing files and printers.

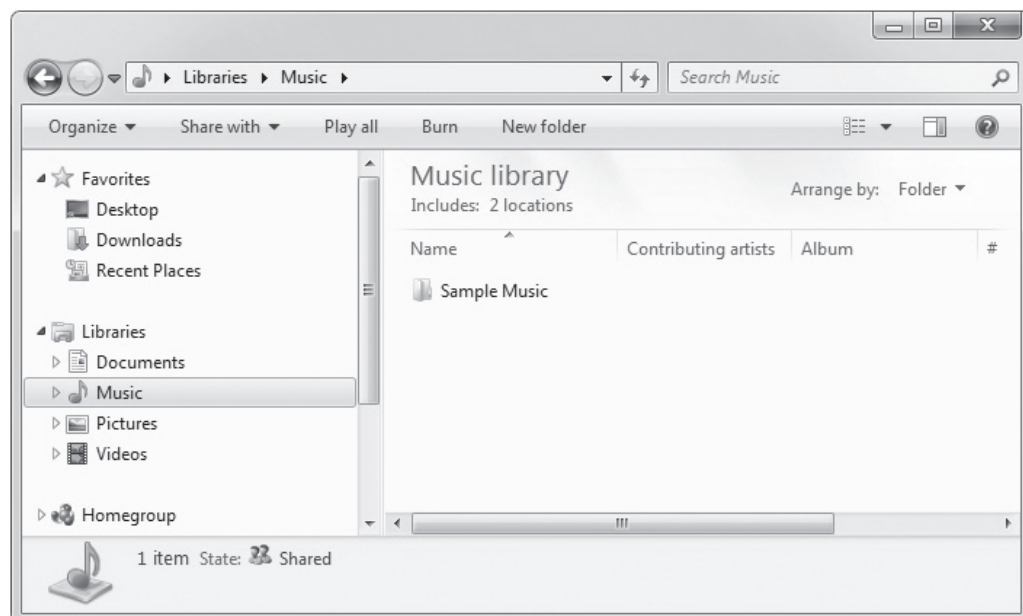
One of the easiest ways to share files and printers across a small office/home office network is with **HomeGroup**, the file and printer sharing solution built into Windows 7. Once you set up a homegroup on one computer, other networked computers running Windows 7 can join the homegroup and automatically see the shared libraries and printers. You also have some control over the level of access other users have to your shared items. You can choose to let other users simply view and use your items, or configure settings for modifying, deleting, and adding items to your shared libraries.

Computers that are members of a homegroup display in the navigation pane in the Homegroup section of Windows Explorer. Just click the name of the computer whose files you want to access, then navigate to the folder or file as you normally do in Windows Explorer. If you don't see a computer that's a member of a homegroup in the navigation pane, the computer might be powered off, in sleep mode, or hibernating.

You can also see at a glance which libraries you're sharing. The Details pane at the bottom of the Windows Explorer window indicates Shared if the library is shared (see Figure 6-3).

Figure 6-3

The Windows Explorer Details pane indicates shared libraries



Although HomeGroup is easy to set up and use, there are a few caveats:

- In Windows 7 Home Basic and Starter editions, you can only join a homegroup—you cannot create one.
- You can join only one homegroup at a time. If your computer is already joined to a homegroup, you must leave that homegroup to join another.
- You can't limit access to shared items to individual users. Anyone using a computer that's a member of the homegroup can access the shared content.
- Non-Windows 7 computers (such as those running Windows Vista, Windows XP, Mac OS, or Linux) require additional setup steps in order to access shared items in the homegroup.
- You must already have a network set up (either wired or wireless).
- To create or join a homegroup, your computer's network location must be set to "Home network" (in the Network and Sharing Center).
- Do you use your laptop computer at work? If the computer connects as part of a domain at work, you can still join it to a homegroup at home. You'll be able to use folders and printers shared by other computers in the homegroup, but you won't be able to share any of your computer's folders with the group for security purposes.

HomeGroup makes networking a snap for even new computer users. However, as with most technology, things can go wrong. If you run into any problems using HomeGroup, Microsoft provides a HomeGroup troubleshooter that steps you through the troubleshooting process.

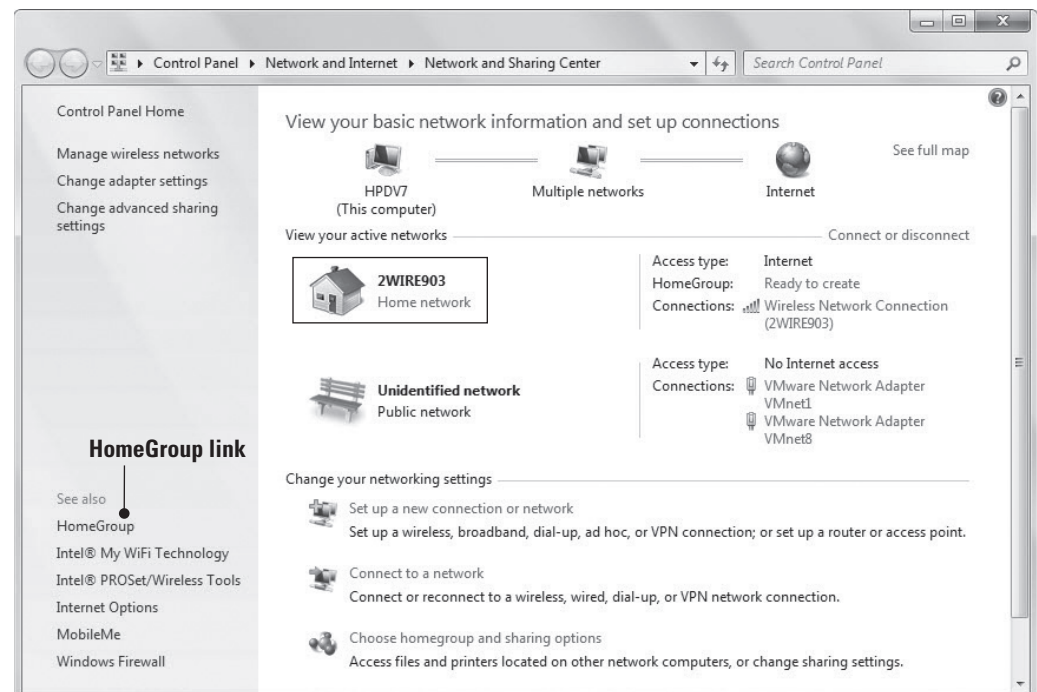


CREATE A HOMEGROUP

GET READY. To create a homegroup, perform the following steps:

1. Ensure that your network setting is set to Home.
2. Click the network icon in the notification area of the taskbar, and then click **Open Network and Sharing Center**. The Network and Sharing Center window indicates the current network location (see Figure 6-4). If network location is set to Work network,

Figure 6-4
The Network and Sharing Center



TAKE NOTE *

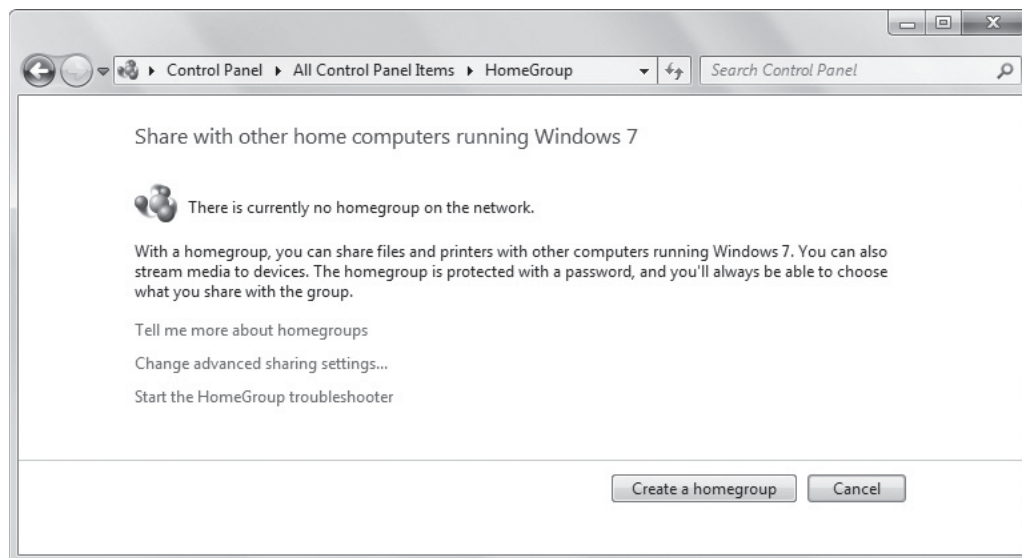
Changing a computer's network location from Public network to Home network can be unsafe.

click the link. In the Network Locations window that displays, click **Home network** and then click **Close**.

3. From the Network and Sharing Center window, click **HomeGroup** in the task pane (left pane).
4. In the next window, click **Create a homegroup** (see Figure 6-5). The Create a Homegroup Wizard starts.

Figure 6-5

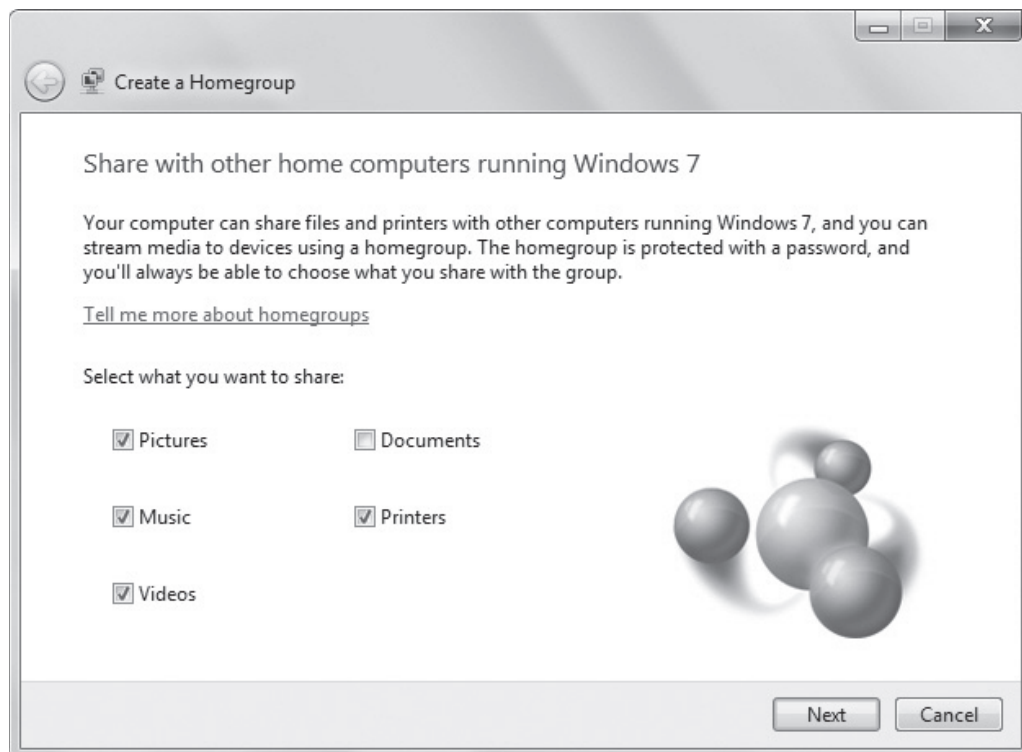
Starting the Create a Homegroup Wizard



5. Select what you want to share with other members of the homegroup (see Figure 6-6). You can change your selections later if you decide to discontinue sharing one or more items. Click **Next**.

Figure 6-6

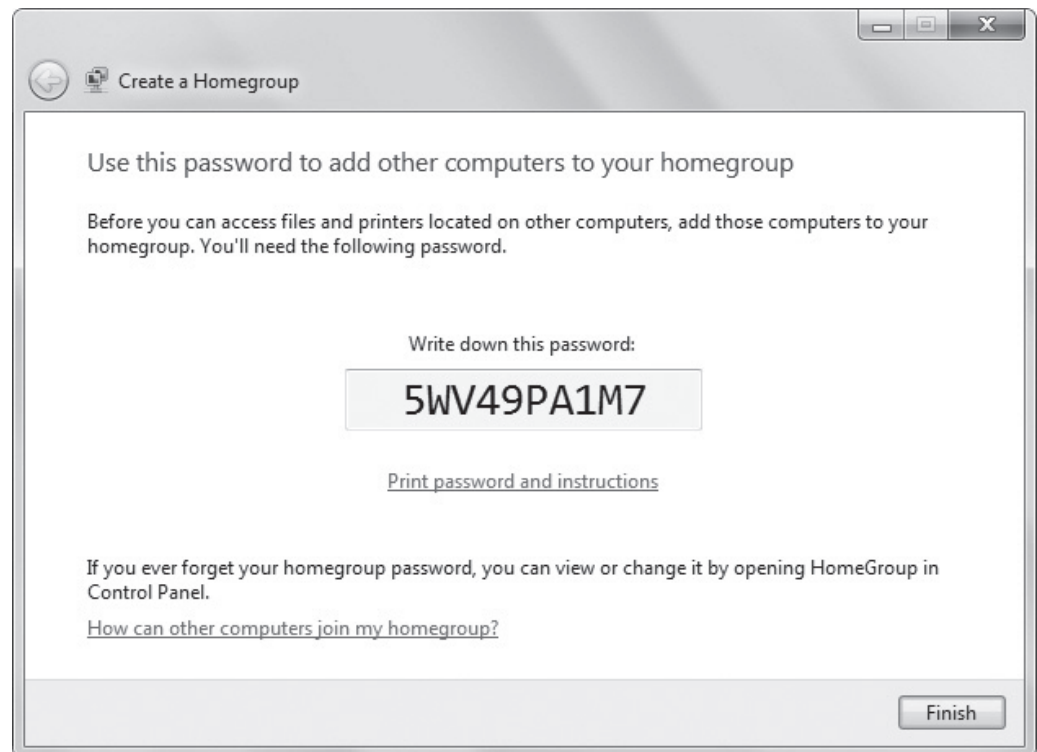
Selecting items to share



6. Windows 7 creates the homegroup settings and then displays a password (see Figure 6-7). Write down the number or click the **Print password and instructions** link to print it; you'll need the password when joining other computers to the homegroup.

Figure 6-7

The homegroup password displays



TAKE NOTE*

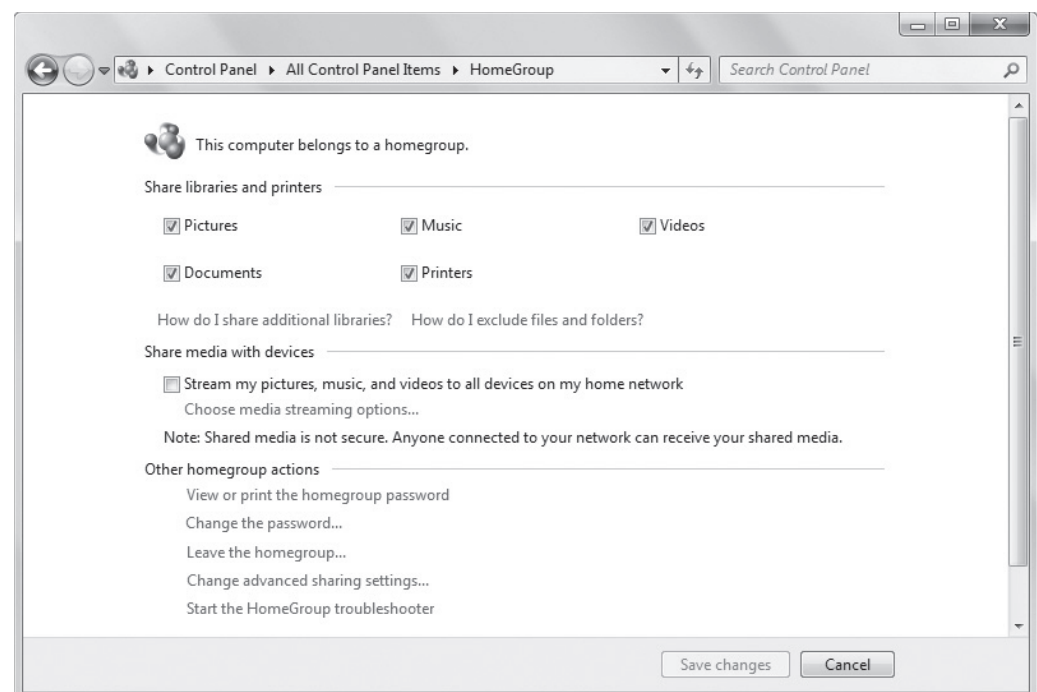
Uppercase and lowercase matter in the homegroup password. Be sure to enter the exact password as shown when joining computers to the homegroup.

7. Click **Finish** to complete the process.

The HomeGroup window now shows that your computer belongs to a homegroup and displays the items that are shared (see Figure 6-8). This window also includes links to additional

Figure 6-8

The HomeGroup window confirms that a homegroup was created



actions you can take with HomeGroup, such as viewing or changing the homegroup's password, leaving the homegroup, and troubleshooting the homegroup's connectivity.

You can close the HomeGroup window if you like. Now that you've set up a homegroup, you will learn how to go to another Windows 7 computer to join it to the homegroup.



JOIN A HOMEGROUP

GET READY. To join a computer to a homegroup, perform the following steps:

1. Log on to another Windows 7 computer on the network and ensure that the network location is set to Home in the Network and Sharing Center. (Refer to Step 1 in the "Create a Homegroup" section of this lesson if you need help.)
2. Click **Start > Control Panel**. In the Network and Internet section, click the **Choose homegroup and sharing options** link and then click **Join now**.
3. Select the types of files that this computer user wants to share with the rest of the homegroup. Click **Next**.
4. Type the homegroup password and click **Next**.

TAKE NOTE *

If you don't know the homegroup password, go to a computer that's already a member of the homegroup and then click **Start > Control Panel > Choose homegroup and sharing options > View or print the homegroup password**.

X REF

Recall from Lesson 3 that you can stream media files across a network using HomeGroup.

5. Click **Finish**.

Repeat these steps on all other Windows 7 computers that you want to join to the homegroup. Each user can decide which item, if any, she wants to share with the homegroup. If a user doesn't share items, her user name will not display in the Homegroup listing (left pane) in Windows Explorer.



CONTROL HOMEGROUP ACCESS

GET READY. To control homegroup access, perform the following steps:

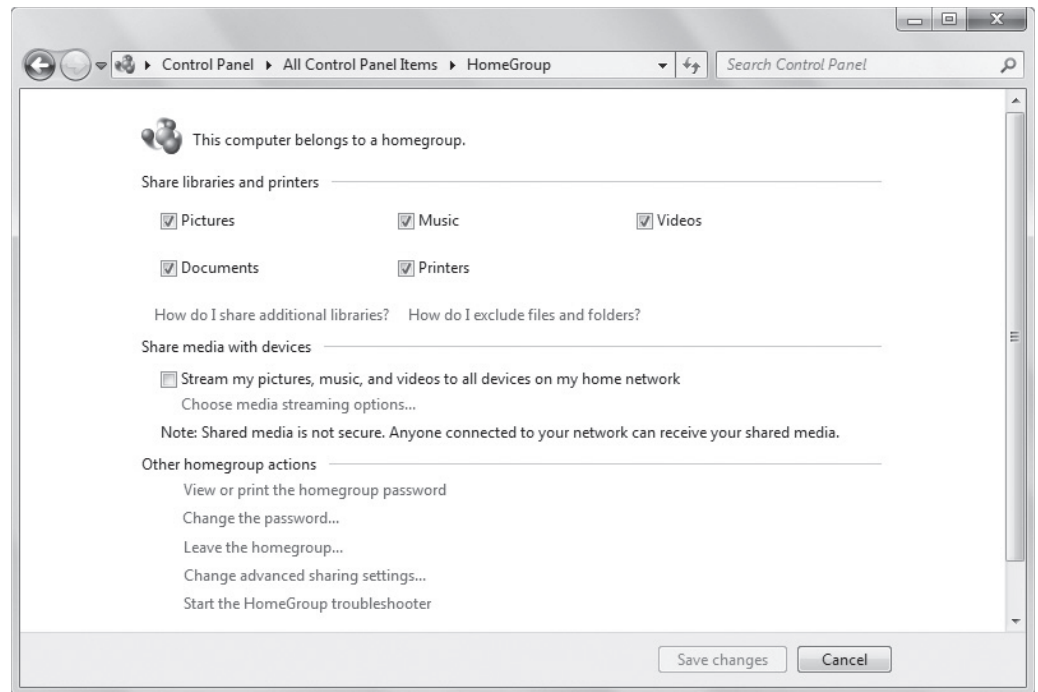
1. Click **Start > Control Panel** and then click the **Choose homegroup and sharing options** link in the Network and Internet section to open the HomeGroup window.
2. Deselect the appropriate check box in the Share libraries and printers section (see Figure 6-9).
3. Click **Save changes**.

To exclude specific files or folders within a library:

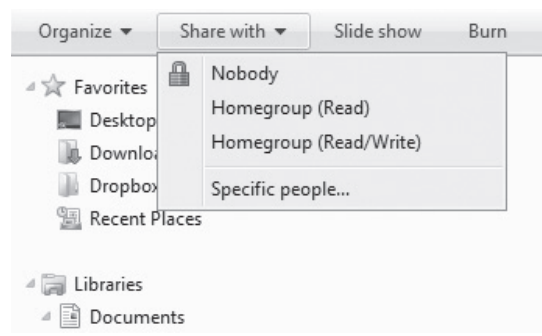
1. Open Windows Explorer.
2. Navigate to the file or folder you want to exclude from sharing and select it.
3. Do one of the following:
 - To prevent access to the file or folder, click **Share with** in the toolbar and then click **Nobody** (see Figure 6-10).
 - To restrict homegroup members to viewing a shared file or folder (rather than being able to write), click **Share with** in the toolbar and then click **HomeGroup (Read)**.

Figure 6-9

Uncheck a library check box to prevent sharing

**Figure 6-10**

The Share with menu



+ MORE INFORMATION

For more information about Windows 7 HomeGroup, visit <http://windows.microsoft.com/en-US/windows7/products/features/homegroup>, <http://windows.microsoft.com/en-US/windows7/help/home-sweet-homegroup-networking-the-easy-way>, and [http://technet.microsoft.com/en-us/library/ee449408\(Ws.10\).aspx](http://technet.microsoft.com/en-us/library/ee449408(Ws.10).aspx). You can learn more about file sharing in Windows at <http://windows.microsoft.com/en-US/windows7/File-sharing-essentials>. If you need help connecting non-Windows 7 computers to a homegroup, visit <http://windows.microsoft.com/en-us/windows7/help/sharing-files-and-printers-with-different-versions-of-windows>

■ Creating Public, Basic, and Advanced Shares



THE BOTTOM LINE

Windows 7 provides Public folders and traditional file sharing capabilities to meet your networking needs. Public folders are a quick-and-easy way to share files with network users and with other users on your computer. Basic and advanced sharing allow you to control who may access specific files and folders located in your libraries. Advanced sharing offers the most options and is therefore the best choice for protecting confidential information.

CERTIFICATION READY

What are the primary differences between Public, basic, and advanced shares?

4.2

HomeGroup isn't the only way to share files and folders in Windows 7. You can also use traditional Windows file sharing to share individual files or folders, or move files or folders to a Public folder.

Traditional Windows file sharing offers greater control over sharing with Public folders. In traditional file sharing, depending on who you choose to share files or folder with, you can generally apply permissions to restrict users to simply viewing (reading) files as well as allow them to modify and/or delete files.

Let's look at Public folders first, since this method is the most convenient of the two methods.

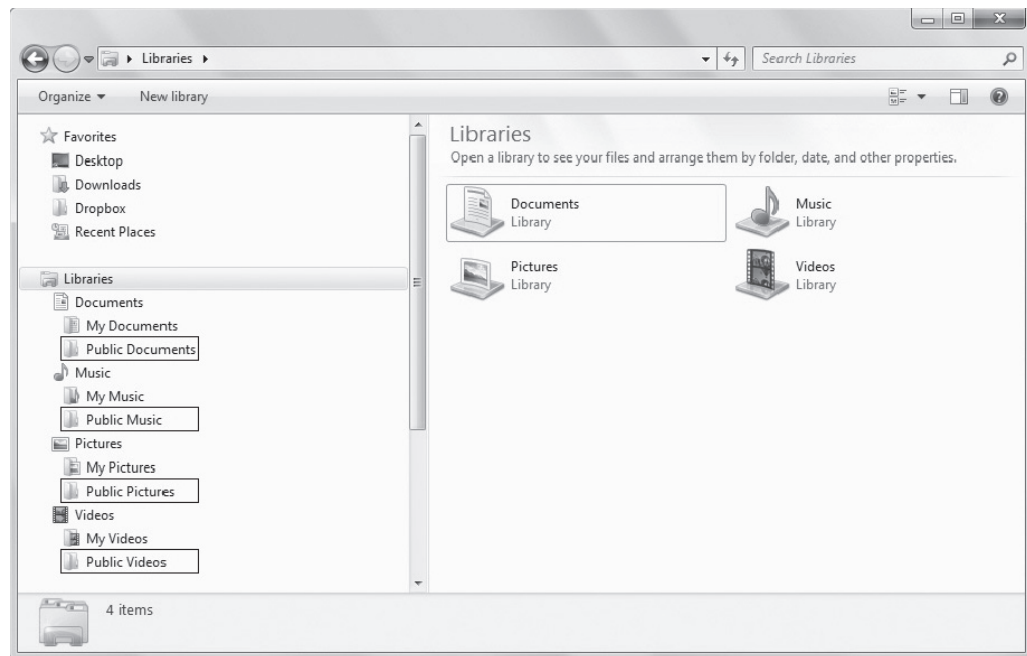
Using Public Folders

If you need to share files with other users who have accounts on your computer or with users on a network, Public folders is a convenient drag-and-drop method.

Perhaps the easiest way to quickly share files and folders with other users on a network is by copying or moving them into one of the Windows 7 Public folders. Each default library in Windows 7 has **Public folders** (see Figure 6-11), such as Public Documents, Public Music, and so on. You just drag and drop items you want to share into the appropriate Public folder. Other users on your computer or on your network can use Windows Explorer to navigate to the files, and then open the files just as if the files were on their own computers.

Figure 6-11

Libraries expanded to show Public folders in Navigation pane



One consideration is that if you simply copy a file to a Public folder to share with someone, you have two instances of that file on your computer. If you want to change the file, you must change it in one place and copy it to the other to keep both versions current. For example, you're working on a spreadsheet named Projects.xlsx in your My Documents

folder. You copy it to the Public Documents folder so a co-worker can also view it. When you update Projects.xlsx in My Documents, you also need to save it again or copy the new version to Public Documents. For this reason, if you want to share the most current version of a file at all times using Public folders, you should move the file to the Public folder rather than try to maintain two versions.

Public folders are all about convenience, but they don't offer a lot of control. For example, you can't limit which files or folders are shared in a Public folder—everything is shared. Plus, anyone with network access can read and write files in the Public folders.

Public folder sharing in Windows 7 is turned off by default (except on a homegroup). When Public folder sharing is turned on, anyone on your computer or network can access these folders. When Public folder sharing is turned off, only people with a user account and password on your computer have access. In addition, Windows offers a password-protected sharing feature that you can use to limit Public folder access to people with a user account and password on your computer.



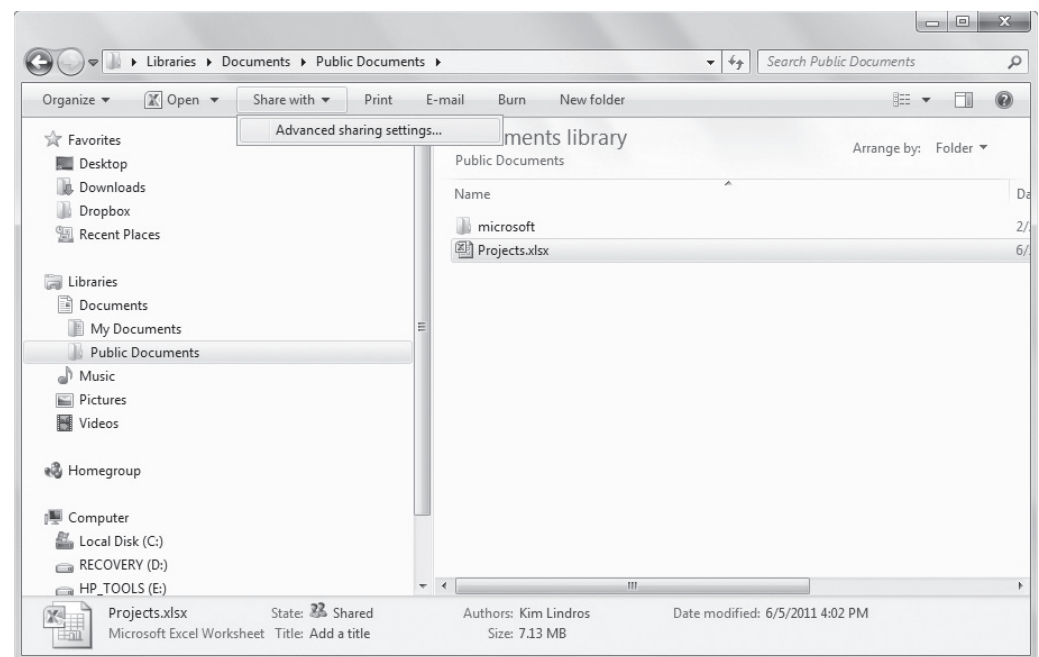
TURN PUBLIC FOLDER SHARING ON OR OFF

GET READY. To turn Public folder sharing on or off, perform the following steps:

1. Click any Public folder, click the **Share with** menu on the toolbar, and then click **Advanced sharing settings** (see Figure 6-12).

Figure 6-12

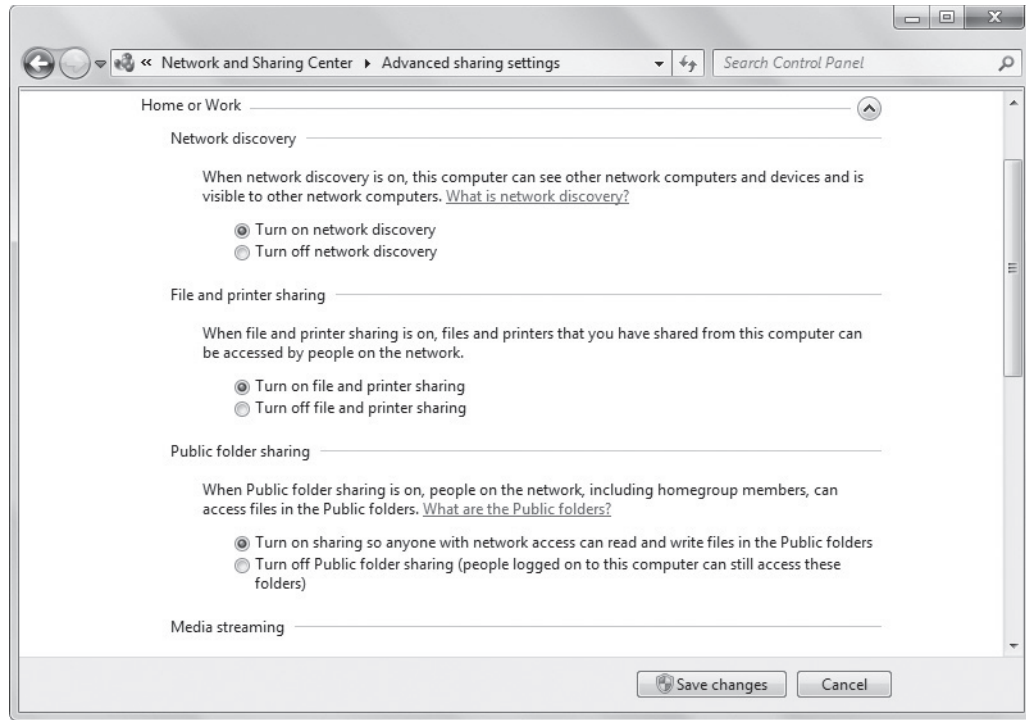
Selecting Advanced sharing settings from the Share with menu



2. Click the **Home or Work** down arrow to access the profile settings.
3. In the **Public folder sharing** section, select an option to turn sharing on or off. Figure 6-13 shows the option selected to turn sharing on.
4. Click **Save changes** at the bottom of the Advanced sharing settings window. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Figure 6-13

Public folder sharing options

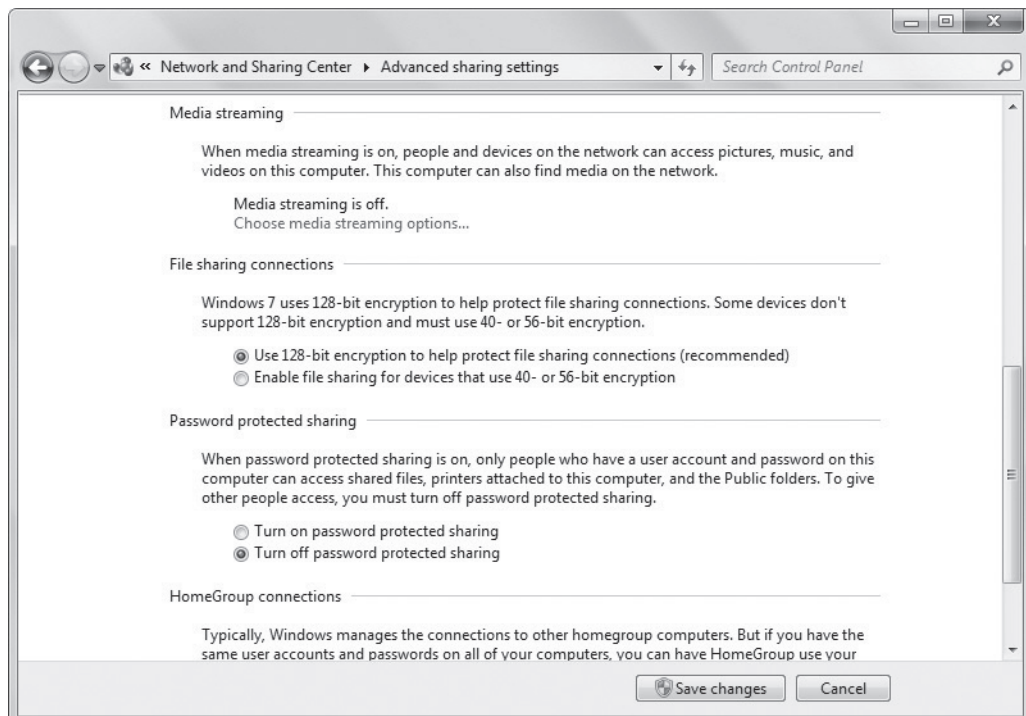
**TURN PASSWORD-PROTECTED SHARING ON OR OFF**

GET READY. To turn password-protected sharing on or off, perform the following steps:

1. Click any Public folder, click the **Share with** menu on the toolbar, and then click **Advanced sharing settings**.
2. Click the **Home or Work** down arrow to access the profile settings.
3. In the **Password protected sharing** section, select an option to turn password-protected sharing on or off (see Figure 6-14).

Figure 6-14

Password protected sharing options



4. At the bottom of the Advanced sharing settings window, click **Save changes**. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Remember, by turning on password-protected sharing in Control Panel, you can limit Public folder access to people with a user account and password on your computer.

MORE INFORMATION

You can learn more about file sharing in Windows 7 at <http://windows.microsoft.com/en-US/windows7/File-sharing-essentials> and <http://windows.microsoft.com/en-US/windows7/Share-files-with-someone>. For specific information about sharing files with the Public folder, go to <http://windows.microsoft.com/en-US/windows-vista/Sharing-files-with-the-Public-folder>

Using Basic and Advanced Shares

If you need more control over who has access to your shared files and folders, use Windows basic or advanced sharing.

HomeGroup and Public folders are easy, convenient methods of sharing files with other users. However, we often store confidential information on our computer drives that must remain protected from some or all other users. HomeGroup allows you to share entire libraries, which includes those confidential files if they're stored in your My Documents folder. Public folders give you more control over what is shared—you copy or move files to a Public folder to make them available to other users. However, what if you want to leave a document or folder in place (that is, not transfer it to a Public folder) and still share it with others but without sharing other files and folders in the same library?

Traditional Windows file sharing allows you to restrict access to shared specific files and folders, and choose which users have access. **Basic sharing** allows you to share a file or folder with a specific user and restrict the user to Read or Read/Write actions. **Advanced sharing** offers the greatest amount of control; you can:

- Share files, folders, or an entire drive
- Choose users or groups with which to share files and folders
- Limit the number of users who may use a file or folder at the same time, mainly for security purposes
- Set permissions on shared files and folders, such as allowing users Read, Change, or Full Control
- Choose which files are available to users offline

To set up basic or advanced shares, you must make sure file sharing and network discovery are turned on. A best practice is to also turn on password-protected sharing for security purposes.

TAKE NOTE*

You'll learn about permissions later in this lesson.



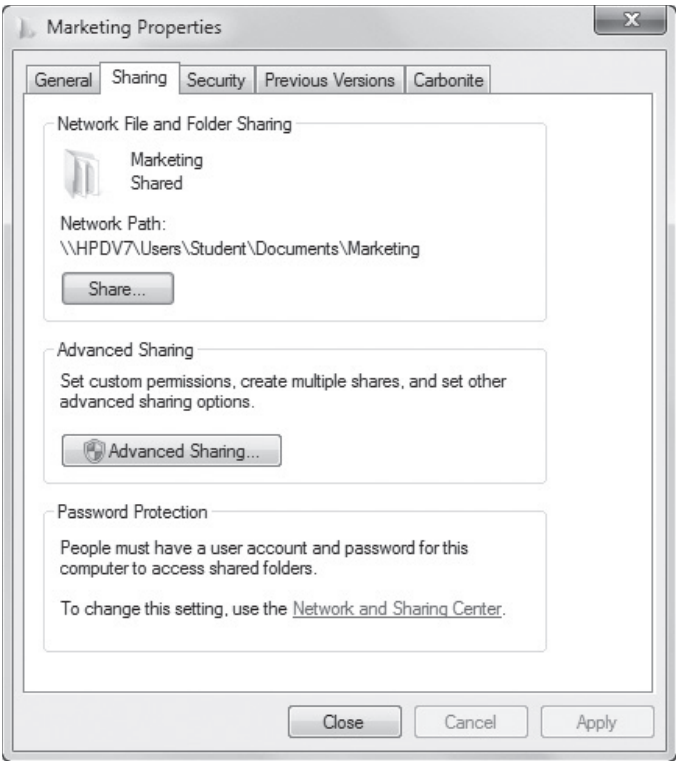
SET UP A BASIC SHARE

GET READY. To set up a basic share for a specific user, perform the following steps:

1. In Windows Explorer, navigate to the file or folder you want to share. This exercise assumes you are not working with Public folders.
2. Right-click the file or folder, select **Properties**, click the **Sharing** tab in the Properties dialog box (see Figure 6-15), and then click the **Share** button. Alternately, right-click the file or folder, click **Share with**, and then click **Specific people**.

Figure 6-15

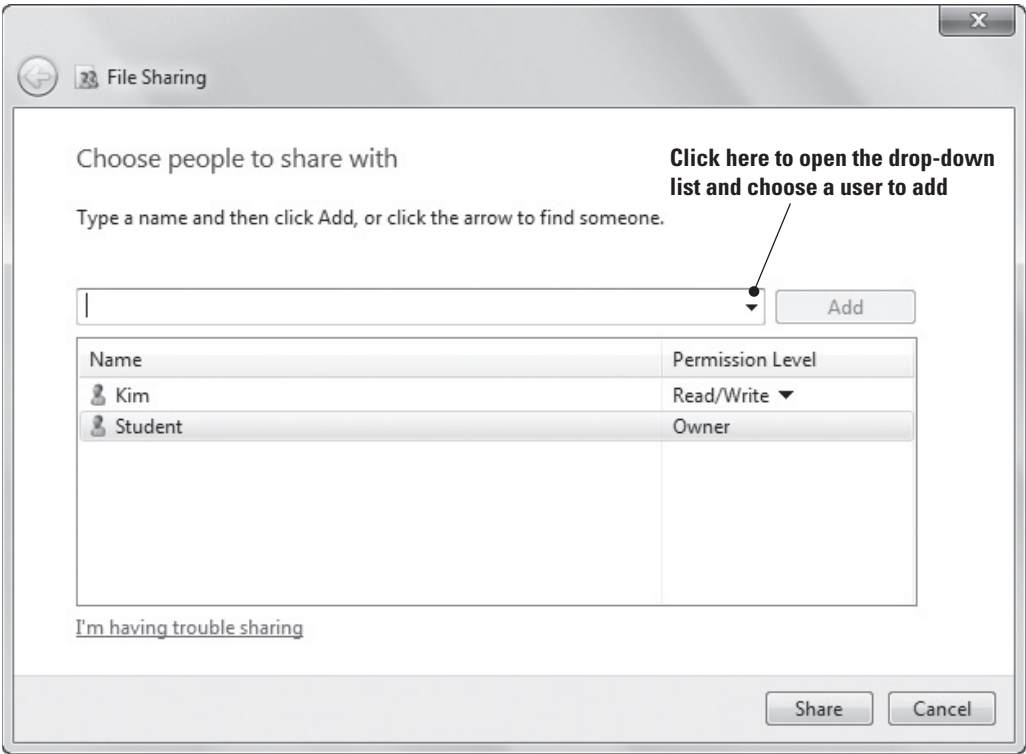
The Sharing tab in the Properties dialog box



3. The File Sharing Wizard starts. Click the arrow next to the text box, click a name from the list, and then click **Add** (see Figure 6-16). Alternately, if you know the user name of the person you want to add, type it in the text box and click **Add**.

Figure 6-16

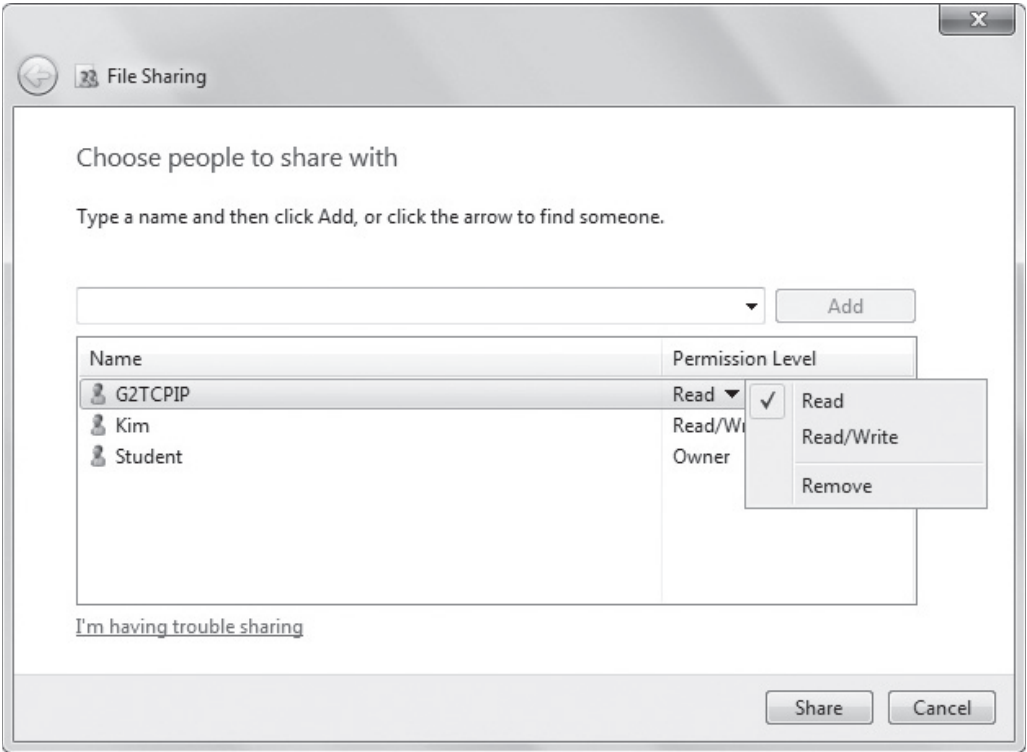
The File Sharing Wizard



4. In the **Permission Level** column, click the down arrow for the new user and select **Read** or **Read/Write** (see Figure 6-17). Read allows the user to open and view items but not make changes or delete them. Read/Write allows users to open, modify, and delete items. You can also remove the user by clicking **Remove**.

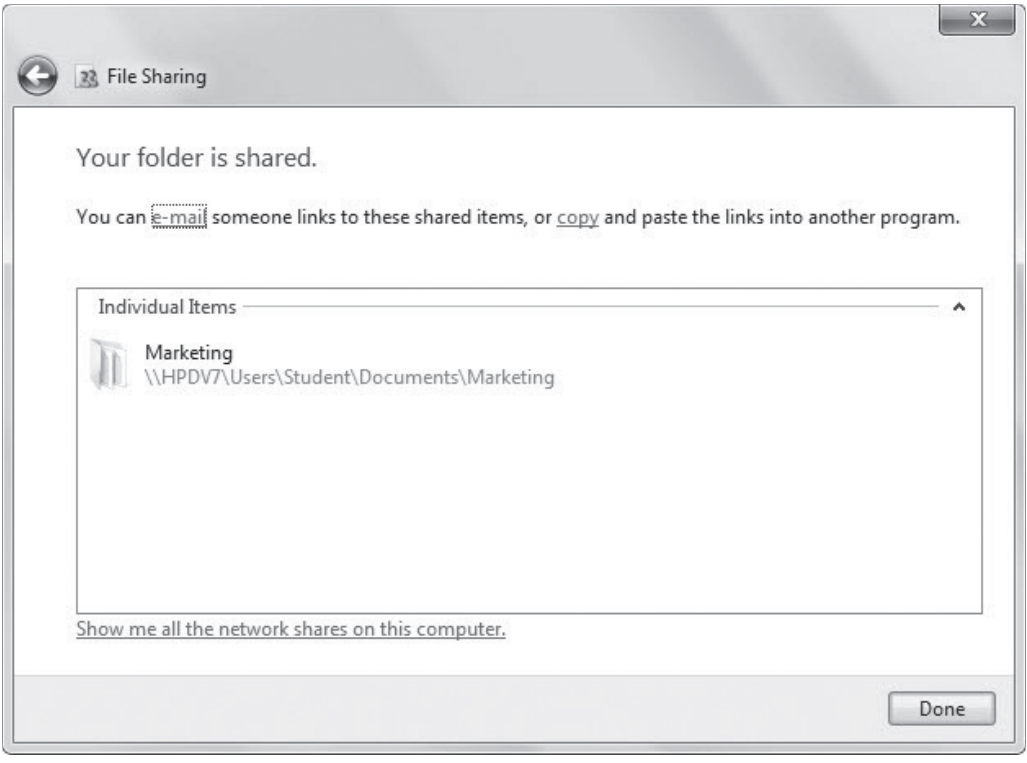
- 5. When you're finished, click **Share**. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Figure 6-17
Selecting permissions



- 6. After you set up a basic share for a user, Windows lets you send a confirmation to that user via e-mail, or you can copy and paste a link to the shared item and send it to the user via e-mail or instant messaging, for example. (See Figure 6-18.)
- 7. When you're finished, click **Done**.

Figure 6-18
Notification options after setting up a basic share



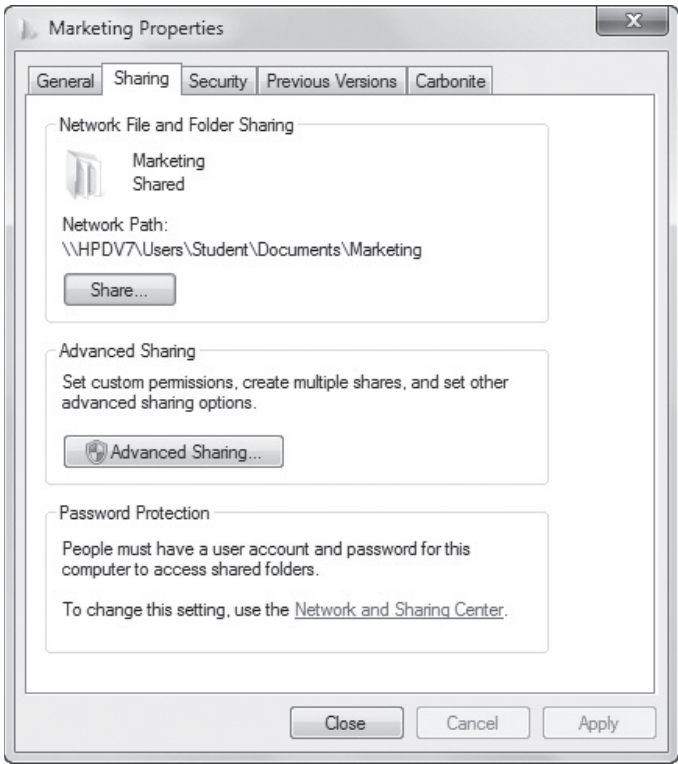


SET UP AN ADVANCED SHARE

GET READY. To set up an advanced share, perform the following steps:

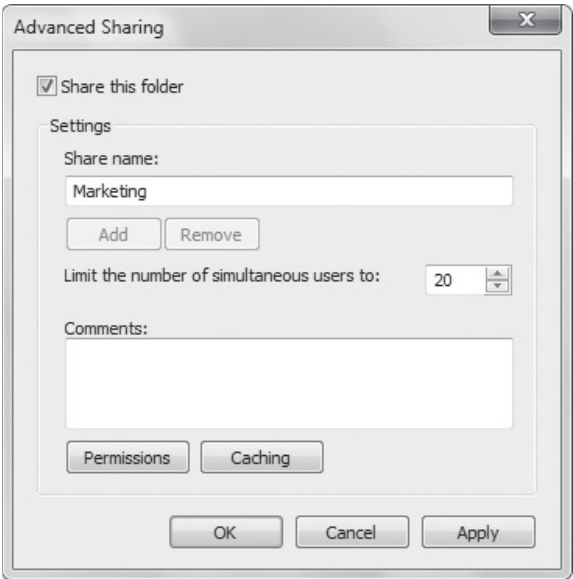
- 1. In Windows Explorer, navigate to the file, folder, or drive you want to share. This exercise assumes you are not working with Public folders.
- 2. Right-click the item to be shared, select **Properties**, click the **Sharing** tab in the Properties dialog box (see Figure 6-19), and then click the **Advanced Sharing** button. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.

Figure 6-19
The Sharing tab in the Properties dialog box



- 3. In the Advanced Sharing dialog box, select the **Share this folder** check box (see Figure 6-20).

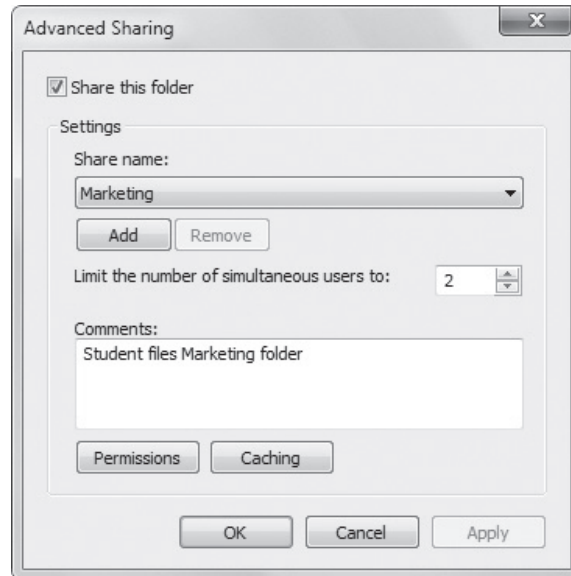
Figure 6-20
The Advanced Sharing dialog box



4. Use the **Limit the number of simultaneous users to** spin box to select the number of users who may access the item simultaneously.
5. In the **Comments** text box, type a description of the shared item (if desired). See Figure 6-21.

Figure 6-21

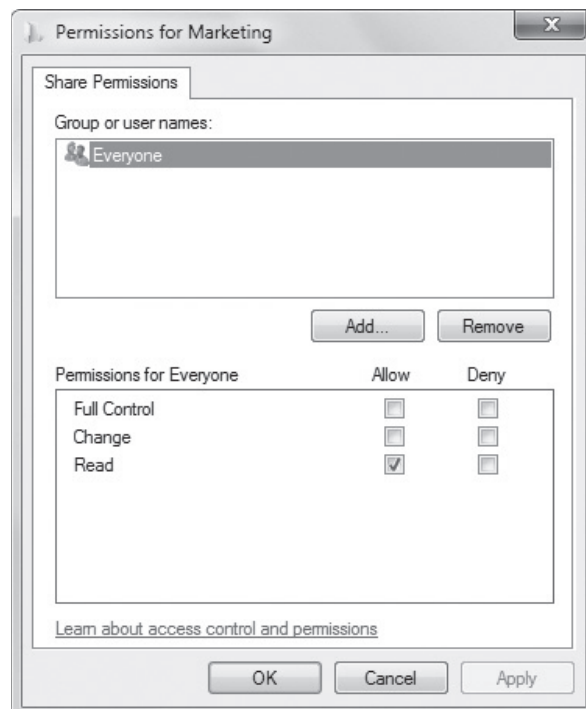
The Advanced Sharing dialog box with information added



6. To specify users or groups, or change permissions, click the **Permissions** button. The Permissions dialog box displays (see Figure 6-22).

Figure 6-22

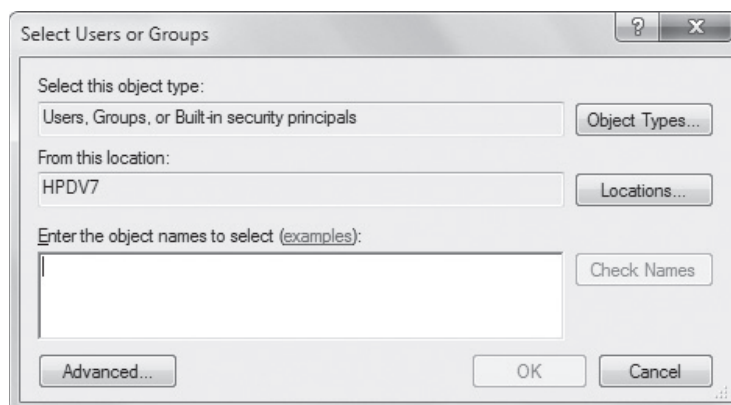
The Permissions dialog box



7. Click **Add** to add a user or group. (You can also click **Remove** to remove a user or group from the share.) The Select Users or Groups dialog box displays (see Figure 6-23).

Figure 6-23

The Select Users or Groups dialog box



8. Type a user or group name in the text box or click **Locations** to find a user or group to add. When you're finished, click **OK**.
9. In the Permissions dialog box, select a user or group, select the check boxes for the permissions you want to assign, and then click **OK**.
10. When you're finished, click **OK** to close the Advanced Sharing dialog box.

Now your selected user or group can share your file, folder, or drive. You'll learn more about permissions later in this lesson.

■ Mapping Drives



THE BOTTOM LINE

Drive mapping allows you to create a shortcut to a shared folder across a network. Instead of finding and connecting to the shared drive each time you log on, you can create a mapped drive that is available at all times. Just double-click the mapped drive to access the shared folder.

CERTIFICATION READY

What is a mapped drive?

4.2

Once you share a folder or drive on your computer with other users, an easy way for them to get to the shared item is by *mapping a drive*. A mapped drive is a shortcut to a shared folder or drive on another computer across a network. Windows Explorer makes this process easy and straightforward.

By default in Windows 7, network drive letters start from the back of the alphabet (Z: is the first default drive letter that displays) and work down, so as not to interfere with local drives (which start with A: and work up). When mapping a drive, you can select any drive letter that's not already in use.

A mapped network drive is displayed in Windows Explorer under Computer in the navigation pane.



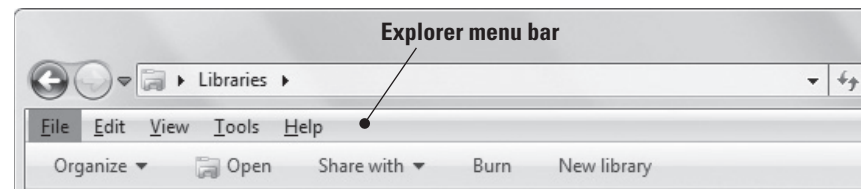
MAP A DRIVE

GET READY. To assign a drive letter to a shared folder on the network, perform the following steps:

1. Open Windows Explorer.
2. Press the **Alt** key to display the Explorer menu bar (see Figure 6-24).

Figure 6-24

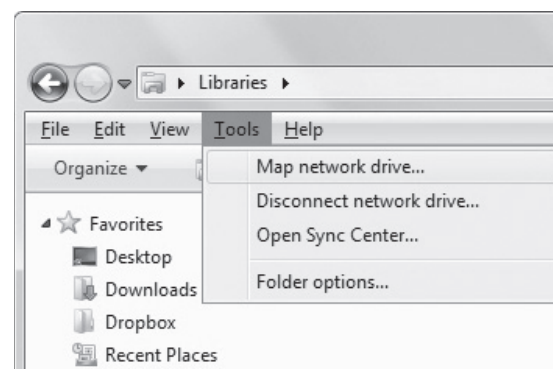
The Explorer menu bar displays near the top of the Windows Explorer window after pressing the Alt key



3. Click the **Tools** menu (see Figure 6-25) and then choose **Map network drive**.

Figure 6-25

Selecting the Map network drive command



4. The Map Network Drive Wizard starts. In the drop-down menu, select a drive letter of your choice (see Figure 6-26).
5. Click **Browse** and then navigate to the shared folder you want to map to (see Figure 6-27). Alternately, type the Universal Naming Convention (UNC) path of the folder. A UNC is a naming format that specifies the location of a resource on a local area network. The UNC format is `\\computername\sharename\filepath`. The *computername* and *sharename* variables refer to the computer or server on which the folder resides. The *filepath* variable is the name of the folder you're mapping.
6. Select the shared folder and then click **OK**.

Figure 6-26
Selecting a drive letter from the drop-down list

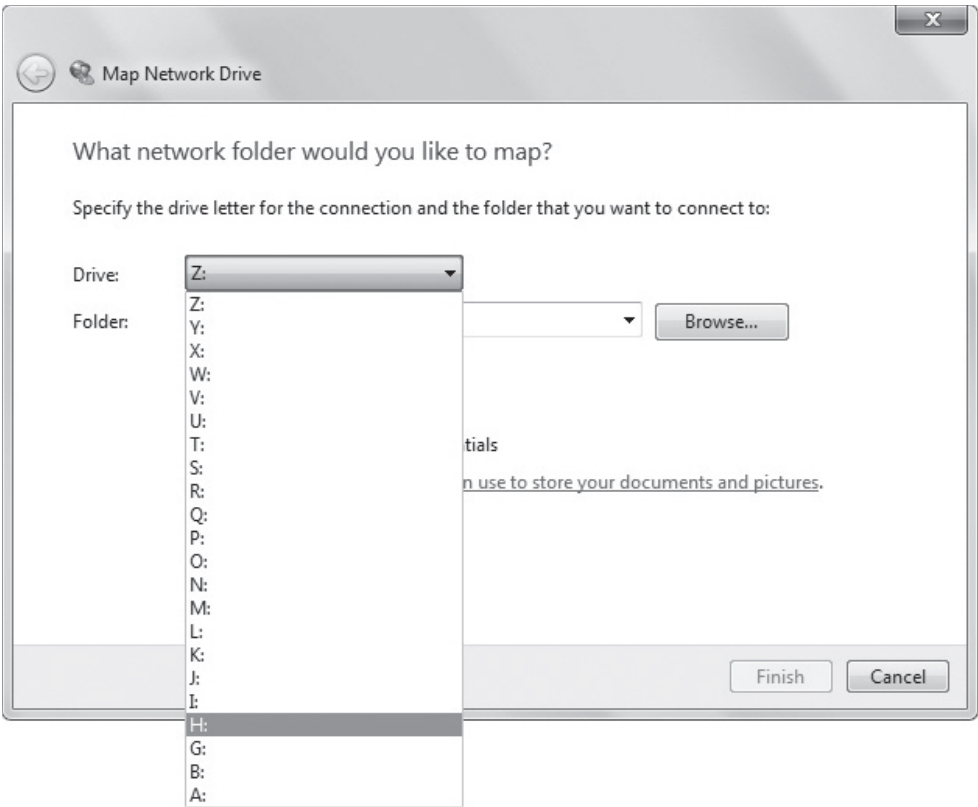
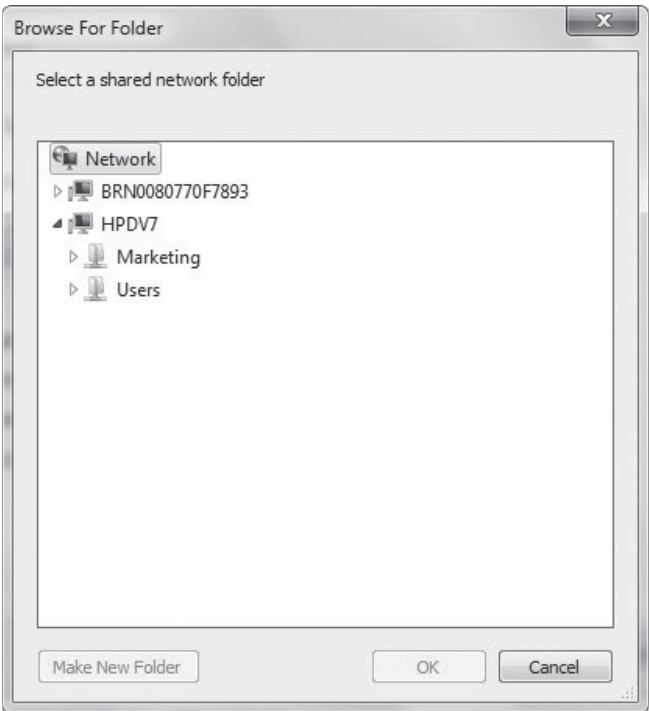


Figure 6-27
Browsing for a drive or folder to map to

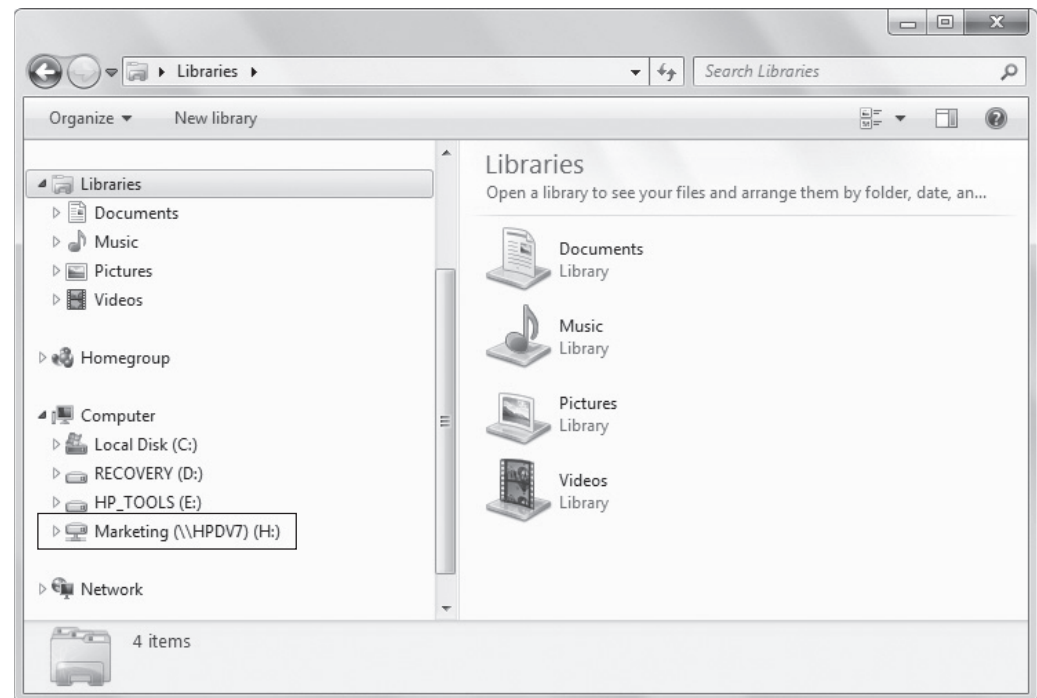


7. By default the **Reconnect at logon** check box is selected. This means the drive mapping will persist until you manually disconnect it (using the Disconnect network drive entry in the Tools menu in Windows Explorer). When you're done, click **Finish**.

The mapped drive displays in the Windows Explorer navigation pane (see Figure 6-28). Click it to access the shared folder.

Figure 6-28

A shared folder with a drive mapping



+ MORE INFORMATION

For more information about mapping drives in Windows 7, visit <http://windows.microsoft.com/en-US/windows7/Create-a-shortcut-to-map-a-network-drive>

■ Understanding Permissions



THE BOTTOM LINE

Permissions allow you to restrict the actions other users may take on shared items, such as files, folders, drives, and so on.

You've seen permissions when sharing files and folders. **Permissions** are rules you apply to users and groups to limit actions they can take on shared resources, such as files, folders, drives, network shares, and even printers. For example, you can restrict some users to only view (read) files, but allow other users to modify and/or delete files in the same folder.

TAKE NOTE *

Permissions can be granted or revoked by the owner of a resource, system administrators, and users with administrative accounts.

Basic permissions on files and folders in Windows 7 are described in Table 6-1.

Table 6-1
Basic File and Folder
Permissions in Windows 7

PERMISSION LEVEL	DESCRIPTION
Full control	Allows users to view and change files and folders, to create new files and folders, and to run programs in a folder.
Modify	Allows users to change files and folders but they cannot create new ones.
Read & execute	Allows users to view the contents of files and folders and to run programs in a folder.
Read	Allows users to view the contents of a folder and to open files and folders.
Write	Allows users to create new files and folders and to change files and folders.

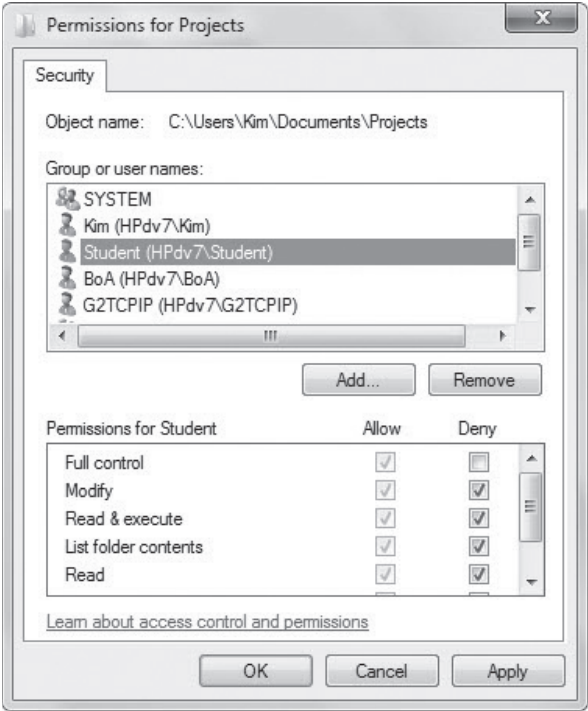


CHECK AND MANAGE PERMISSIONS FOR A FILE OR FOLDER

GET READY. To check the permissions of a file or folder in Windows 7, perform the following steps:

- 1. In Windows Explorer, right-click a file or folder and then click **Properties**.
- 2. Click the **Security** tab.
- 3. In the **Group or user names** section, click a user name or group.
- 4. The permissions for the selected user or group display in the Permissions section (lower portion) of the Properties dialog box. See Figure 6-29.

Figure 6-29
Viewing permissions for a file
or folder

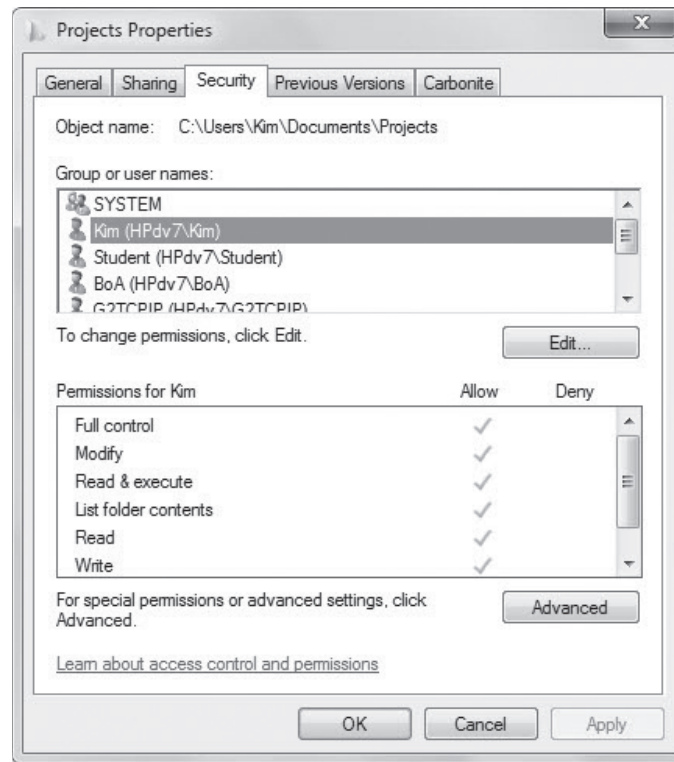


To change a permission for a user, perform the following steps:

- 1. With the user selected in the Properties dialog box, click **Edit**. The Permissions dialog box displays.

2. In the Group or user names section, click a user name.
3. Select and deselect the boxes in the Permissions section to allow or deny access. (See Figure 6-30.)

Figure 6-30
Changing permissions



4. Click **OK** to apply the permissions and close the dialog box.

Clicking the Advanced button on the Security tab in the Properties dialog box lets you fine-tune permissions.

+ MORE INFORMATION

To learn more about permissions, visit <http://windows.microsoft.com/en-US/windows7/What-are-permissions>

Understanding NTFS, Share, and Effective Permissions

Windows 7 includes share and NTFS permissions. Share permissions apply to users who connect to a shared folder over a network; NTFS permissions apply to users who log on locally or from across a network. Effective permissions for an object, such as a folder, are permissions granted to a user or group based on the permissions granted through group membership and any permissions inherited from the parent object.

CERTIFICATION READY

To whom does an NTFS permission apply?

4.2

Share permissions apply to users who connect to a shared folder over a network; **NTFS permissions** apply to users who log on locally or from across a network. You set share permissions in a folder's Properties dialog box on the Sharing tab, and you set NTFS file permissions using the options on the Security tab. If you set share permissions and NTFS permissions on a shared folder, the more restrictive permissions apply to users who access the shared folder.

TAKE NOTE *

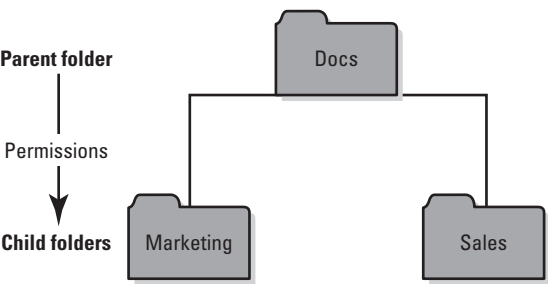
NTFS permissions are far more granular (detailed) than share permissions and apply only to NTFS-formatted volumes.

For example, let's say you grant a user named Stacie the Read permission on a network share. However, her account has the Full Control NTFS permission on the same folder. Because the Read permission is more restrictive, Stacie has only Read access when connecting over the network.

Another important permissions concept is inheritance. In a file system, a folder with subfolders is considered the parent folder. The subfolders are considered child folders. After you set permissions on a parent folder, new files and subfolders that are created in the folder *inherit* these permissions, as shown in Figure 6-31.

Figure 6-31

Parent and child folder permission inheritance



TAKE NOTE *

To set NTFS permissions, open a command prompt window and use the `icacls.exe` tool.

The concept of inheritance is important to keep in mind when setting NTFS permissions. When users:

- Copy files and folders, the files and folders inherit permissions of the destination folder (see Figure 6-32).
- Move files and folders within the same volume, they retain their permissions (see Figure 6-33).
- Move files and folders to a different volume, they inherit the permissions of the destination folder (see Figure 6-34).

Figure 6-32

Copying files or folders

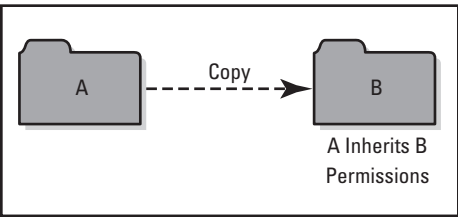


Figure 6-33

Moving files or folders within an NTFS volume

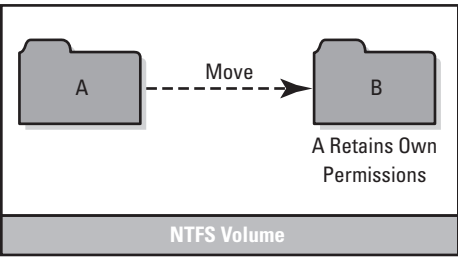
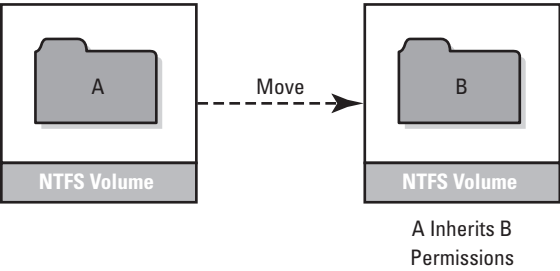


Figure 6-34

Moving files or folders from one NTFS volume to another

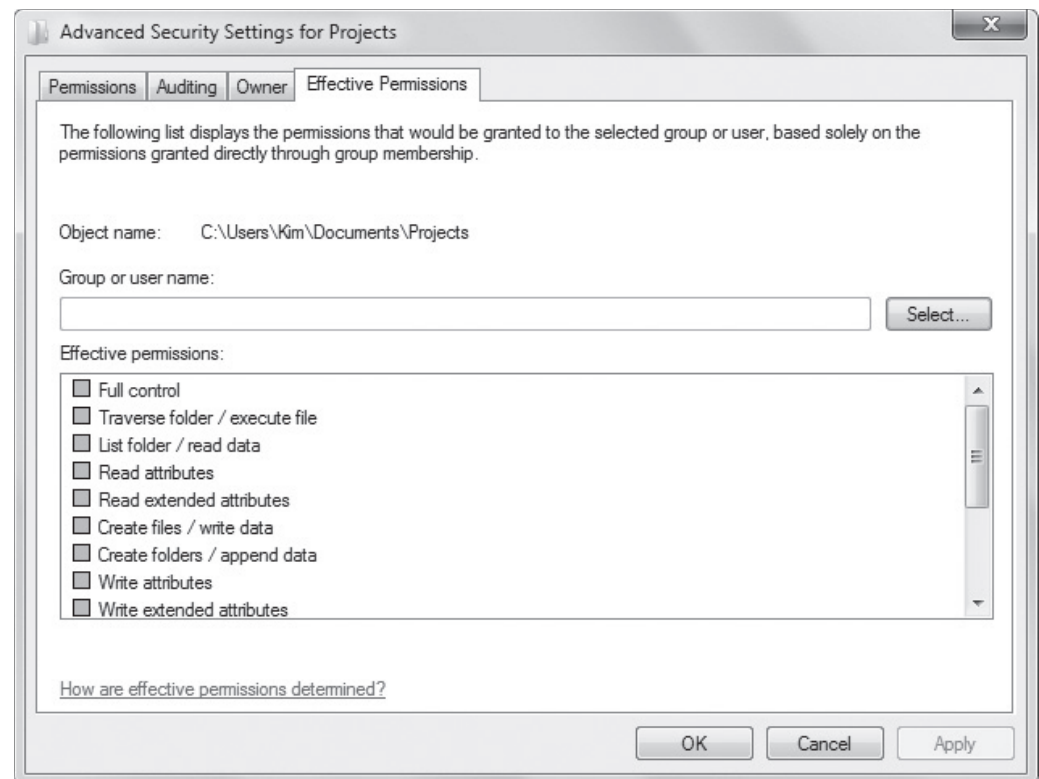


Effective permissions for an object, such as a folder, are permissions granted to a user or group based on the permissions granted through group membership and any permissions inherited from the parent object. Windows does not include share permissions as part of the effective permissions.

To view effective permissions for a folder, for example, right-click the folder, click Properties, click the Security tab, select a user or group, click the Advanced button, and then click the Effective Permissions tab in Advanced Security Settings dialog box (see Figure 6-35).

Figure 6-35

The Effective Permissions tab



Understanding the different levels of permissions can be a challenge for a newbie. You should research Windows permissions thoroughly before making major changes to permissions.

+ MORE INFORMATION

For more information about NTFS and share permissions, visit <http://technet.microsoft.com/en-us/library/cc754178.aspx> and <http://technet.microsoft.com/en-us/library/cc726004.aspx>. To learn more about effective permissions, visit <http://technet.microsoft.com/en-us/library/cc772184.aspx>

■ Setting Up Printer Sharing



THE BOTTOM LINE

Printer sharing allows a computer user to share his or her attached printer with other users on a network. Use the Devices and Printers applet to manage and share printers.

As you learned about file sharing earlier in this lesson, you probably noticed that printer sharing was included in some of the file-sharing methods. Windows 7 ties file and printer sharing together in many instances. For example, the HomeGroup window lets you select libraries to

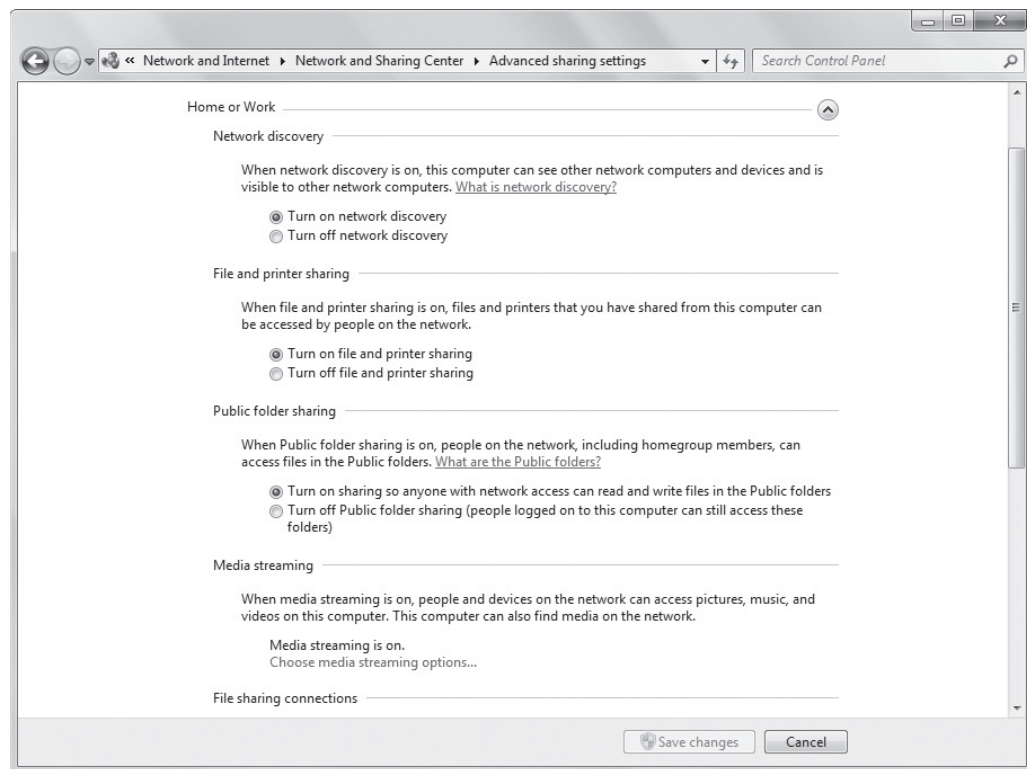
share and includes a Printers check box. The Advanced sharing settings window in Control Panel also includes a File and printer sharing section.

Sharing printers is, in some ways, even easier than sharing files. You can share a printer that's connected to your computer with a cable, such as a universal serial bus (USB) cable, share a networked printer connected directly to a router, or share a wireless network printer. This section focuses on directly attached printers using a cable.

To share any printer, you must ensure that file and printer sharing is turned on in the Advanced sharing settings window (accessed from the Network and Sharing Center). See Figure 6-36. You should also ensure that the printer is operating properly by sending a test page to the printer.

Figure 6-36

The Advanced sharing settings window



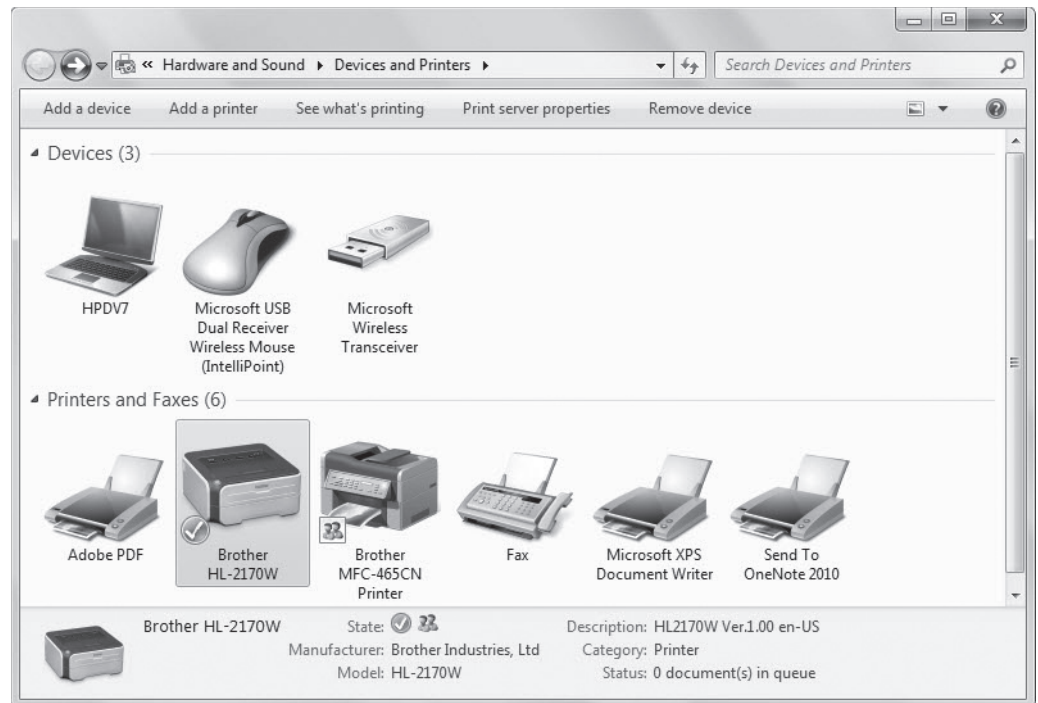
Windows 7 provides the Devices and Printers applet to let you manage one or more printers from a single interface. From here you can add a printer, see what's printing, and remove a printer. As shown in Figure 6-37, Devices and Printers handles more than just printers.

You have two primary ways to work with a printer: Device Stage and the Properties dialog box. Device Stage is a window that's unique to each device in Devices and Printers. Just double-click a printer's icon to open its Device Stage window (see Figure 6-38). You can see jobs that are printing, whether a printer error has occurred, select the default page orientation, click links to go directly to manufacturer information on the Web, and access the printer's properties by clicking the *Customize your printer* link.

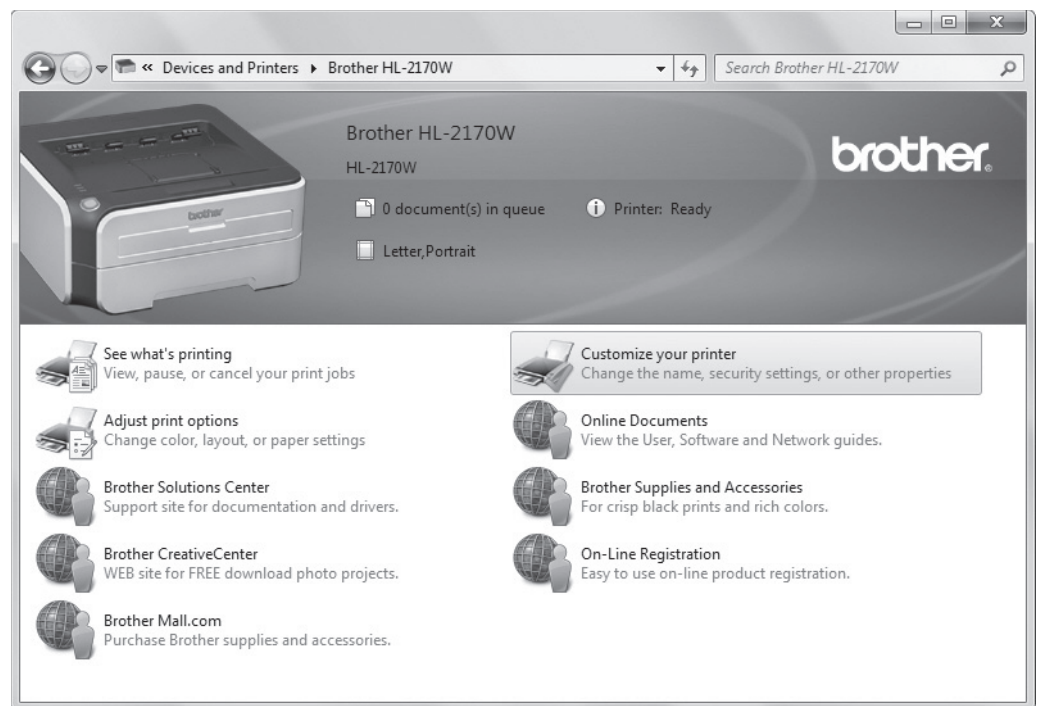
You can also access a printer's properties by right-clicking a printer's icon and then selecting *Printer properties*. Using the tabs in the printer's Properties dialog box (see Figure 6-39), you can configure printer properties, install a new printer driver, share a printer, select a different printer port, limit the time of day the printer is available, enforce security, and much more.

Figure 6-37

The Devices and Printers window

**Figure 6-38**

A printer's Device Stage window



SHARE AN ATTACHED PRINTER

GET READY. To share a printer that's attached to your computer, perform the following steps:

1. Open Devices and Printers by clicking **Start > Devices and Printers**.
2. Right-click the printer you want to share and choose **Printer properties**.
3. Click the **Sharing** tab (see Figure 6-40).
4. Select the **Share this printer** check box and then click **OK**.

Figure 6-39

A printer's Properties dialog box

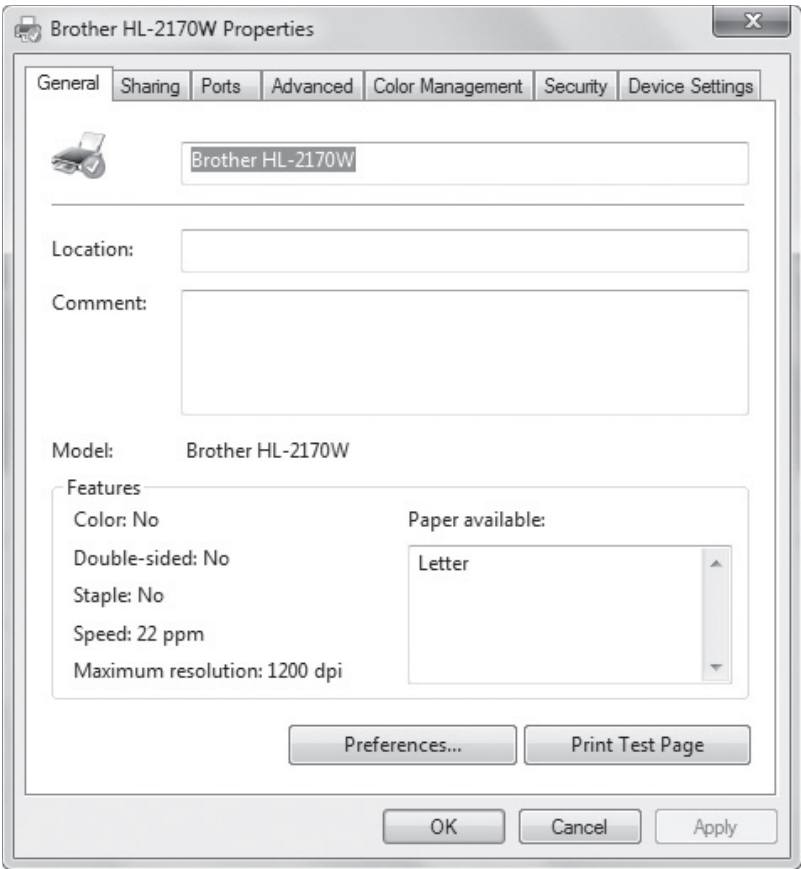
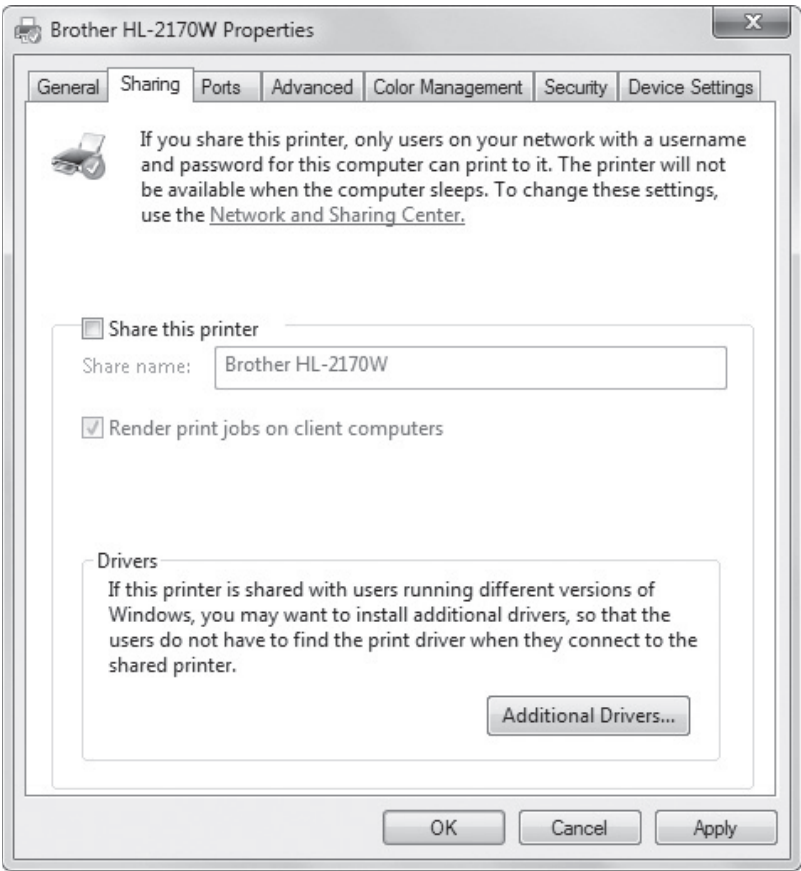


Figure 6-40

The Sharing tab



Other users on your network need to add a network printer to their computers (using Devices and Printers, in Windows 7) and then connect to the shared printer.

+ MORE INFORMATION

For more information about printer sharing, visit <http://windows.microsoft.com/en-US/windows-vista/Share-a-printer>

Understanding Print Drivers

Hardware and peripherals, including printers, require a driver in order to run in Windows. The Devices and Printers applet gives you access to utilities for viewing print driver information and updating drivers.

CERTIFICATION READY

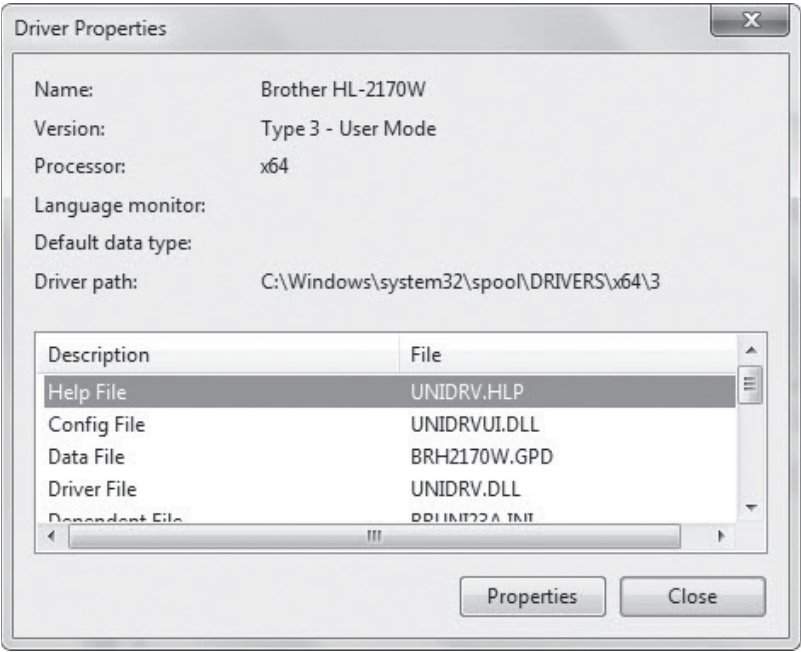
What is a print driver?

4.2

As you learned in Lesson 5, each piece of hardware and peripherals require a driver in order to run in Windows. Printers are no exception. A *printer driver* is a small software program that prepares application data to print to a specific printer.

One way to view a printer's driver information is by using the Printer server properties menu in Devices and Printers. The Drivers tab in the Printer Server Properties dialog box lists all printers installed on the computer. Just double-click the printer of interest to view driver information in the Driver Properties dialog box (see Figure 6-41).

Figure 6-41
The Driver Properties dialog box



Printer manufacturers, like all device manufacturers, update drivers occasionally to fix bugs or to add capabilities for newly released operating systems. For example, if your printer had been working well for some time, but after you installed new software or upgraded your operating system the printer stopped working, you might need to update its driver.

Windows Update checks for new drivers for many devices and installs them during regular updates. However, sometimes you must manually update a driver. (Windows Update might not have a driver for a specific printer due to compatibility issues, for example, or because the

manufacturer recently released a driver that's not yet part of Windows Update.) One method is to use the Add Printer Driver Wizard described in the following exercise. In some cases, it's best to visit the manufacturer's Web site, locate the latest driver for your printer, and download it. In most cases, the driver comes with an installer program, allowing you to double-click the EXE file and install the driver.



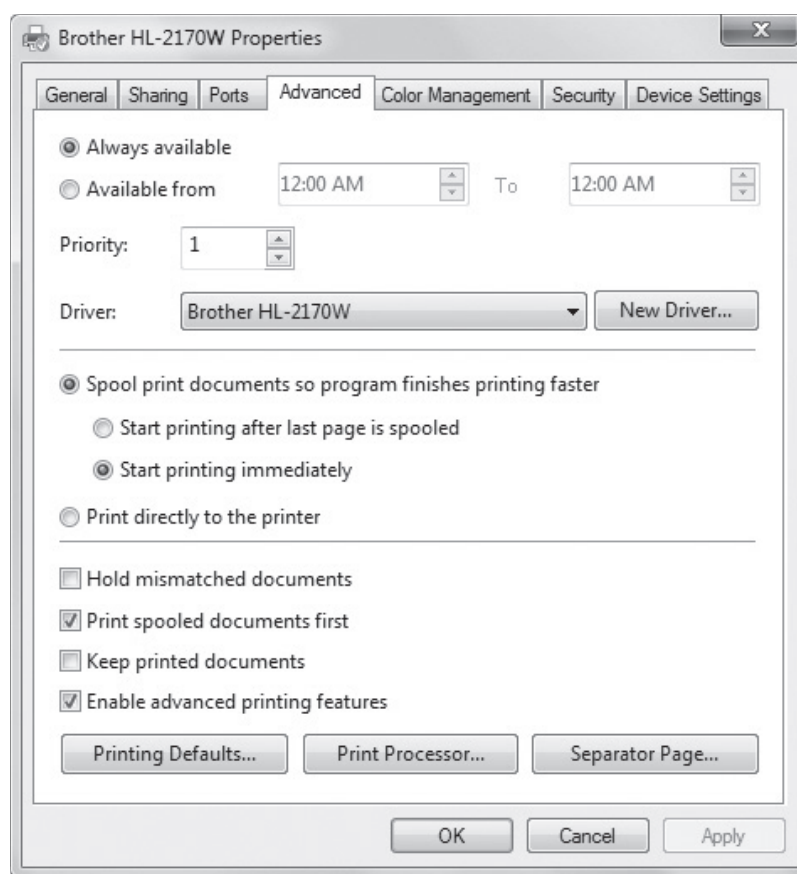
UPDATE A PRINTER'S DRIVER

GET READY. To update a printer's driver, perform the following steps:

1. Open Devices and Printers by clicking **Start > Devices and Printers**.
2. Right-click a printer and choose **Printer properties**.
3. On the Advanced tab (see Figure 6-42), select the printer in the **Driver** drop-down list and then click **New Driver**.

Figure 6-42

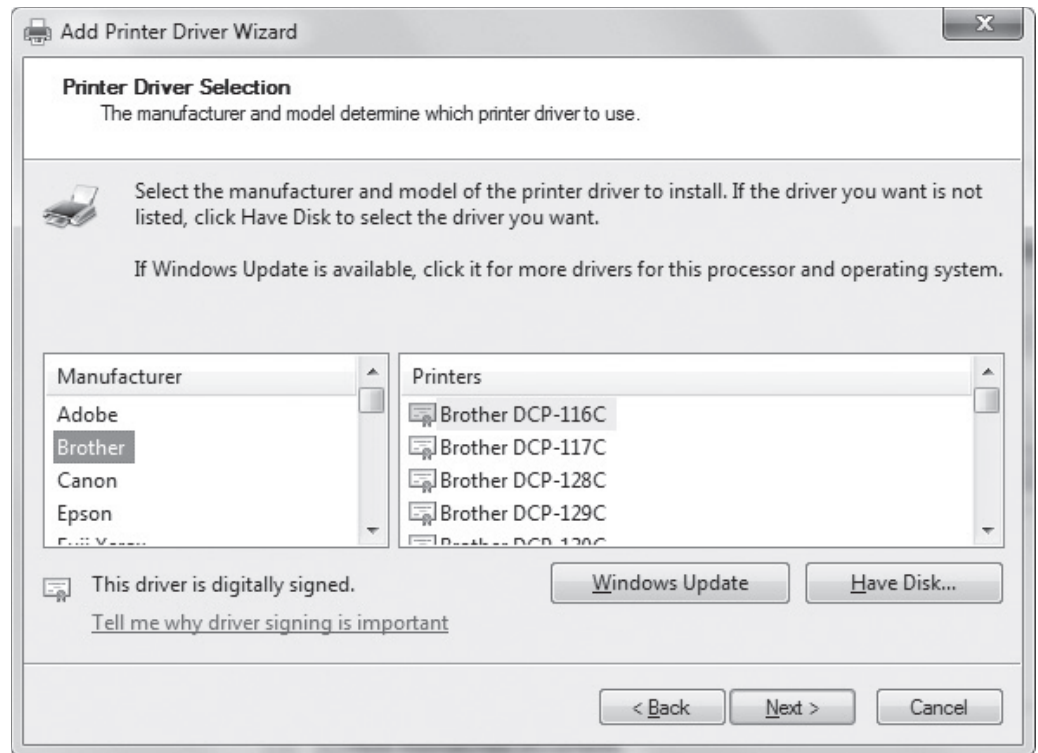
The Advanced tab



4. The Add Printer Driver Wizard starts. Click **Next**.
5. On the Printer Driver Selection screen (see Figure 6-43), scroll through the Manufacturer list and select your printer's manufacturer.
6. In the **Printers** list, find and select your printer model and then click **Next**.
7. Click **Finish**.

Figure 6-43

The Printer Driver Selection screen



If the wizard was unable to update your driver, go to Devices and Printers, double-click the printer, and follow a link to the manufacturer's Web site to download the latest driver. Then return to Step 6 in this exercise and click Have Disk to install the driver manually. If the driver isn't preselected, you might have to browse to the location of the driver.

■ Troubleshooting Printers



THE BOTTOM LINE

Technicians and users alike occasionally have to troubleshoot printer problems. Device Stage, accessed through Devices and Printers, is a good first place to check for clues to the source of printer problems. You can also use a Windows troubleshooter to help resolve issues quickly.

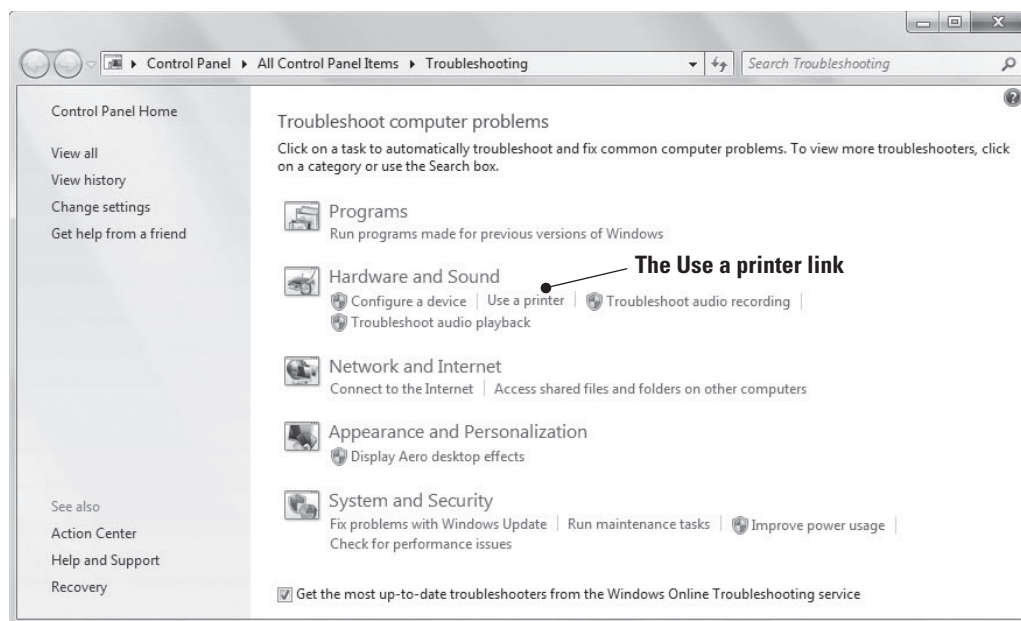
Troubleshooting some printer problems is pretty simple. Make sure the power is on, ensure that the cable is securely connected to the printer and PC, ensure the printer's tray has paper, and check the printer's level of toner or ink, replacing the cartridge if necessary.

Other problems are more complicated and require investigation on your part. The first place to check is Device Stage for the printer that's not working. Device Stage displays the status of the printer along with any error messages that may indicate the problem. If Device Stage doesn't offer enough information, try a Windows 7 **troubleshooter**. Windows troubleshooters are wizard-driven tools that walk you through a software or hardware issue to help you resolve it.

To use a troubleshooter, click Start and in the *Search programs and files* search box, type *trouble* and then click Troubleshooting in the resulting list. In the Troubleshooting window, in the Hardware and Sound section, click the *Use a printer* link (see Figure 6-44).

Figure 6-44

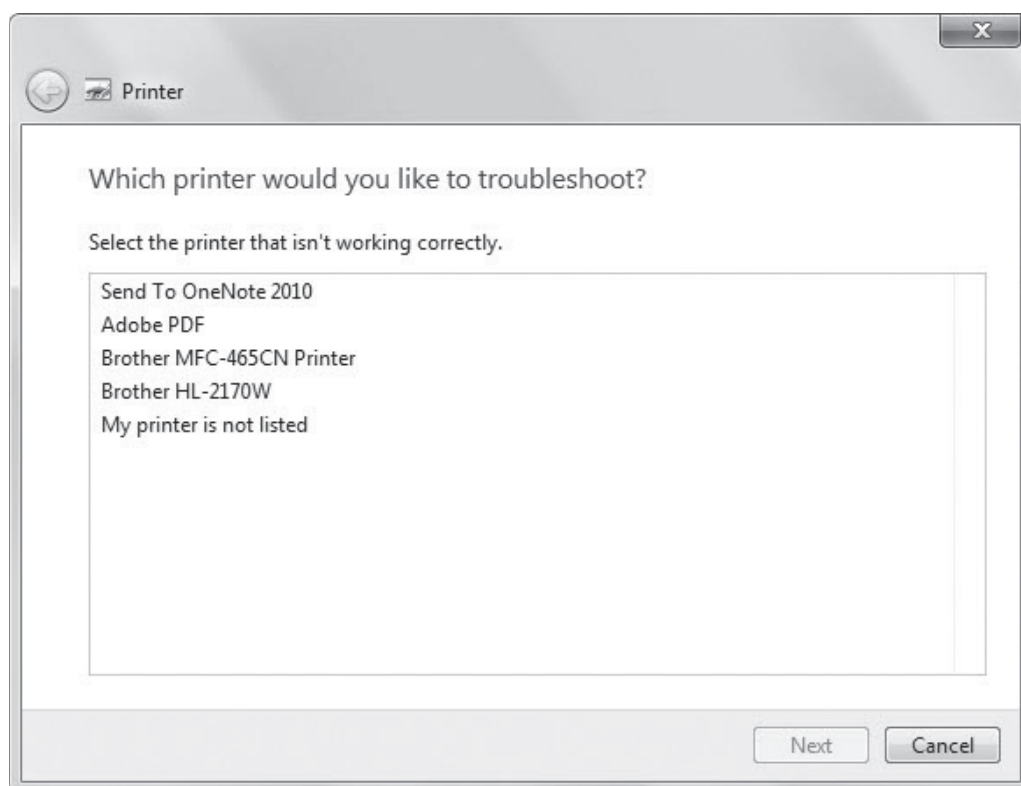
The Use a printer link



When the troubleshooter starts, follow the prompts to select your printer and narrow down the problem (see Figure 6-45). The troubleshooter walks you through a series of questions, much like a live technician would, to help you resolve the issue.

Figure 6-45

Using the printer troubleshooter



Much like with any device, simply powering it off, waiting a minute, and powering it back on clears memory problems. When troubleshooting shared printers, remember to check that the network is making connections between computers. The problem may be network related rather than printer related.

Sometimes the Print Spooler service has stopped communicating with the printer. The example in Lesson 4 described a printer with several duplicate print jobs and an unresponsive print queue. Restarting the printer didn't resolve the problem, so the next likely step was to restart the Print Spooler service in the Services console to clear the print queues.

MORE INFORMATION

For more information about troubleshooting directly connected printers, visit <http://windows.microsoft.com/en-US/windows-vista/Troubleshoot-printer-problems>. To learn more about network printing issues, go to <http://windows.microsoft.com/en-US/windows-vista/Troubleshoot-network-printer-problems>

SKILL SUMMARY

IN THIS LESSON YOU LEARNED:

- Windows 7 provides many ways to share files or printers on a network. The first step is to ensure that file and print sharing is turned on in the advanced sharing settings in Network and Sharing Center. Some networking methods, such as HomeGroup, also require that your network location be set to Home network.
- HomeGroup is a new feature in Windows 7 that greatly simplifies file and printer sharing on small office/home office networks. Using HomeGroup, you may share libraries and printers, but you don't have a lot of control over which users may share the items.
- Public folders are a quick-and-easy way to share files with network users and with other users on your computer. Basic sharing and advanced sharing allow you to control who may access specific files and folders located in your libraries. Advanced sharing offers the most options and is therefore the best choice for protecting confidential information.
- Drive mapping allows you to create a shortcut to a shared folder across a network. Rather than having to find and connect to the shared drive each time you log on, you create a mapped drive that is available at all times. Just double-click the mapped drive to access the shared folder.
- Permissions allow you to restrict the actions other users may take on shared items, such as files, folders, drives, and so on.
- Windows 7 includes share and NTFS permissions. Share permissions apply to users who connect to a shared folder over a network; NTFS permissions apply to users who log on locally or from across a network. Effective permissions for an object, such as a folder, are permissions granted to a user or group based on the permissions granted through group membership and any permissions inherited from the parent object.
- Printer sharing allows a computer user to share his or her attached printer with other users on a network. Use the Devices and Printers applet to manage and share printers.
- Hardware and peripherals, including printers, require a driver in order to run in Windows. The Devices and Printers applet gives you access to utilities for viewing print driver information and updating drivers.
- Technicians and users alike occasionally have to troubleshoot printer problems. Device Stage, accessed through Devices and Printers, is a good first place to check for clues to the source of printer problems. You can also use a Windows troubleshooter to help resolve issues quickly.

■ Knowledge Assessment

Fill in the Blank

Complete the following sentences by writing the correct word or words in the blanks provided.

1. A _____ is a collection of security settings that's appropriate for the type of network you want to connect to.
2. Each default library in Windows 7 has _____, created to easily share documents, music, and so on with network users.
3. _____ allows you to share a file or folder with a specific user and restrict the user to Read or Read/Write actions.
4. After you set permissions on a parent folder, new files and subfolders that are created in the folder _____ these permissions.
5. _____ permissions apply to users who log on locally or by using Remote Desktop.
6. A Windows 7 _____ walks you through a series of questions, much like a live technician would, to help you resolve printer and other issues.
7. _____ allows you to share files, folders, or an entire drive, set permissions on shared files and folders (Read, Change, or Full Control), and more.
8. _____ is the built-in file and printer sharing feature in Windows 7 that's designed for small office/home office networks.
9. A _____ is a small software program that prepares application data to print to a specific printer.
10. _____ permissions for an object, such as a folder, are permissions granted to a user or group based on the permissions granted through group membership and any permissions inherited from the parent object.

Multiple Choice

Circle the letter that corresponds to the best answer.

1. Which of the following is *not* a network location in Windows 7?
 - a. Home
 - b. Office
 - c. Work
 - d. Public
2. When your peer-to-peer network has a mix of Windows 7, Windows Vista, and Windows XP computers, which of the following should be used for file sharing?
 - a. Public folders
 - b. HomeGroup
 - c. A workgroup
 - d. A domain
3. What can be done with a homegroup? (Choose all that apply.)
 - a. Share libraries
 - b. Share attached printers
 - c. Allow users to view but not modify or copy shared files
 - d. Choose which folders users may access

4. Once you share a folder on your Windows 7 computer with other users, which of the following can be done to make it easy for those users to get to the shared folder?
 - a. Create a workgroup
 - b. Create effective permissions
 - c. Create NTFS permissions
 - d. Map a drive
5. Regarding NTFS permissions, which of the following is *not* true?
 - a. Copied files and folders inherit permissions of the destination folder
 - b. Copied files and folders retain permissions of the source folder
 - c. Files and folders moved within the same partition retain their permissions
 - d. Files and folders moved to a different partition inherit the permissions of the destination folder
6. Which of the following Windows 7 permissions allows users to view and change files and folders, create new files and folders, and run programs in a folder?
 - a. Write
 - b. Modify
 - c. Read and execute
 - d. Full control
7. Which of the following Public folders is *not* created by default?
 - a. Public Documents
 - b. Public Music
 - c. Public Pictures
 - d. Public Projects
8. Which Windows 7 feature is used to turn Public folders on or off?
 - a. Advanced sharing settings
 - b. The Computer window
 - c. Network and Sharing window
 - d. Devices and Printers window
9. Which Windows 7 feature is used to add a printer?
 - a. Devices and Printers
 - b. Device Manager
 - c. Printer troubleshooter
 - d. Programs and Features
10. What is used to view a printer's driver information?
 - a. Printer troubleshooter
 - b. Printer server properties menu in Devices and Printers
 - c. Printer's Properties dialog box, Sharing tab
 - d. Printer's Properties dialog box, Drivers tab

True / False

Circle T if the statement is true or F if the statement is false.

- | | | |
|---|---|---|
| T | F | 1. You can join two or more homegroups at a time. |
| T | F | 2. When creating a homegroup, you can share libraries but not printers. |
| T | F | 3. Public folder sharing in Windows 7 is turned off by default (except on a homegroup). |
| T | F | 4. Share permissions apply to users who connect to a shared folder over a network. |
| T | F | 5. Windows Update checks for new drivers for many devices and installs them during regular updates. |

■ Competency Assessment

Scenario 6-1: Picking an Appropriate File-Sharing Method

Arnie, a supervisor in a small content translation company, wants to share a status spreadsheet with seven co-workers on a regular basis. His computer runs Windows 7. The peer computers all run Windows 7 and are connected through a wireless network. What method of file sharing should you set up for the supervisor?

Scenario 6-2: Creating and Configuring a Homegroup

Meredith's Pet Shop has three computers in the back office, all running Windows 7. Meredith wants them to share all files in their Documents and Pictures libraries and share a printer attached to one of the computers. How should she set this up?

■ Proficiency Assessment

Scenario 6-3: Restricting Permissions

You are setting permissions on a network share named Marketing. Currently, Bob and Aileen's accounts have Full Control over the Marketing folder. However, you want to restrict both users so that they can revise files within the Marketing folder and create new ones, but cannot revise executing programs. What permissions should you apply?

Scenario 6-4: Mapping a Network Drive

Samuel needs to be able to access the \Projects\Documents\98-349\ folder on the network often and quickly. He doesn't want to click through several folders to get to the one he needs. What can you do to help Samuel?